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Analysis of additional 11 other textbooks

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BOSTON UNIVERSITY

GRADUATE SCHOOL

Thesis

ANALYSIS OF ADDITION DRILL IN THREE TEXTBOOKS

Submitted by

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(B.S., Norwich University, 1923)

In partial fulfilment of requirements for

the degree of Master of Arts

1929

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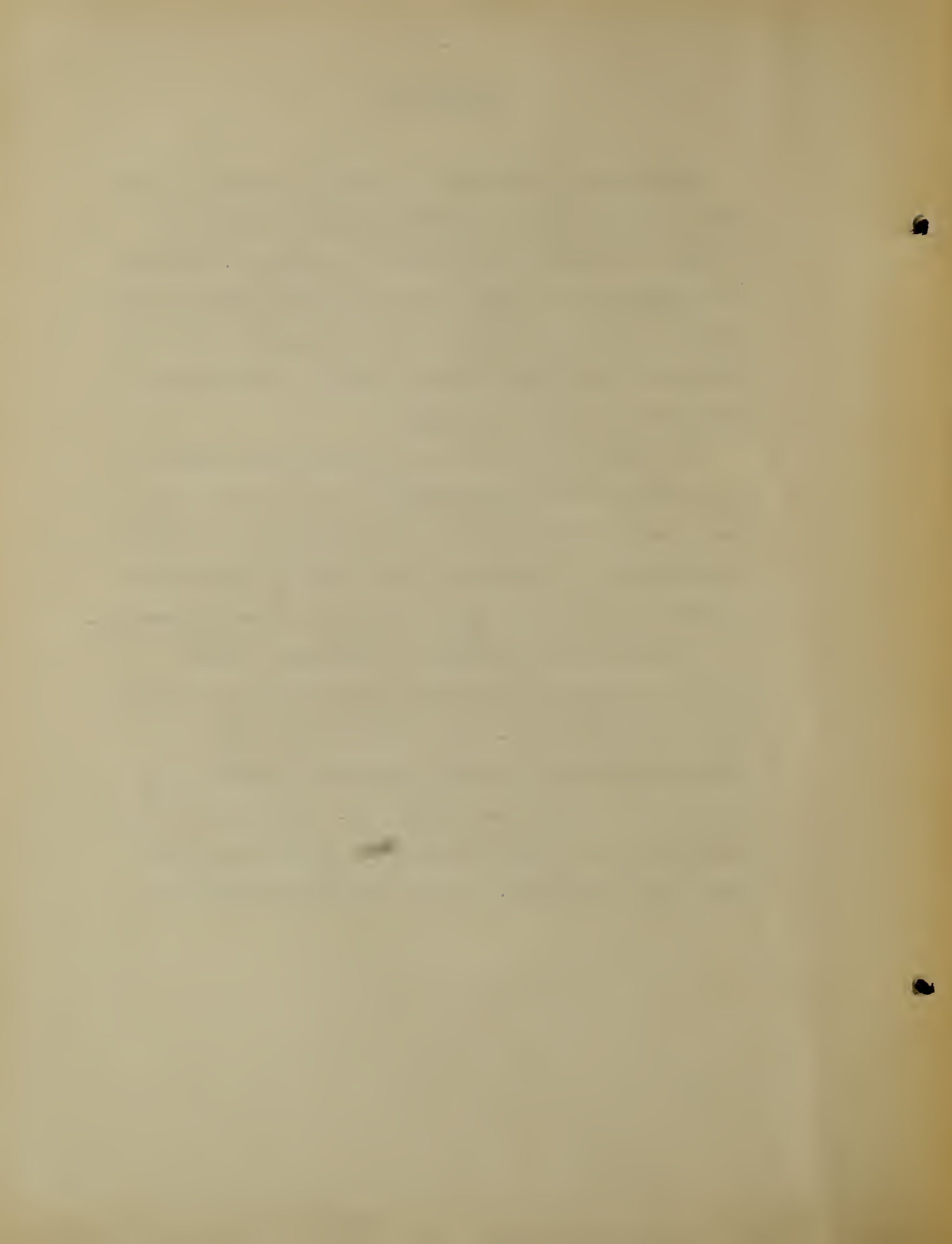
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INTRODUCTION

The purpose of this study is an analysis of three addition drill services in terms of the facts taught and of the units or process steps through which addition is developed. The form of the tables used was worked out by Miss Rebecca Parsons, whose analysis of the Iroquois drill service as developed in the first 186 pages of the Iroquois Arithmetic, Book I, is included in this thesis for record and comparison.

The present study is a unit in a larger problem which has been carried forward in New England for the past four years; namely, the ways and means of obtaining 100% results in teaching the fundamentals of arithmetic. This problem and its direction have been centered in the School of Education at Boston University.

In order to make an analysis of this kind, it becomes necessary to work out every problem in addition and to note the various combinations used. These combinations must then be properly tabulated so as to show each author's teaching groups and his drill on primary and decade facts. The results of this tabulation should disclose the relative efficiency of the drill service under examination, so far as effected by these items.



EXPLANATION OF THE TABLES

There are three separate tables used throughout this analysis. Each table is carried forward by sections and finally accumulated in the summary table.

The first table, which is numbered I, IV, and VII in the respective drill analysis is called the teaching table. It has three parts as follows:

PART "A"

This part shows the primary teaching combinations. The figures in red indicate the new teaching combinations and those in black indicate the combinations which have been previously taught. These combinations are read from the bottom up in each case as $3 + 4$ would be written in the table $\overset{4}{3}$.

In order to make this part of the table clearer Table I, IV, VII sample, page v has been put in and the following combinations plotted: $0 + 2$, $3 + 4$.

Turning to the sample table it will be observed that there is a black figure 2 over a zero. This is the combination $0 + 2$ because it is read from the bottom up. The figure two is in black which indicates that this combination has been taught in a previous teaching group.

Further down on the table a red figure 4 can be seen over the figure 3. This is the second combination $3 + 4$. It will be noted that the red figure 3 indicates that this is a new combination and is being taught in the present teaching group.

PART "B"

This part shows the decade combinations taught up to $39 + 9$ inclusive. The X's in red indicate the new combinations that are being taught in the present teaching group. The X's in black indicate the combinations that have been taught in the previous teaching groups.

The following combinations have been plotted in this section:

10 + 1, 12 + 5.

Turning to the sample table, part "B" on page v it will be noticed that there is a black X opposite the figure 10 and under the figure 1. This is the combination 10 + 1, because this section is read from left to top. Take the number 10 and find it in the list of numbers on the left side of this table. Now follow across horizontally until you arrive at the square under the figure one. This square that you are now in is the square that represents the combination 10 + 1. The black X indicates that the combination has been taught previously.

Following the same procedure as above it will be observed that there is a red X in the square opposite the figure 12 and under the figure 5. This is the combination 12 + 5. The red X indicates that the combination is being taught in the present teaching step.

PART "C"

This part is really a continuation of part "B" and is read in the same way. It contains only the combinations beyond 39 + 9 that are needed in carrying in multiplication.

The second table which is numbered II, V, and VIII in the respective drill analyses is called the frequency table or the tabulation table. It has three parts as follows:

PART "A"

This table is read from left to top like the "B" and "C" parts of the teaching table. The figures in each square indicate the frequency that the combination, represented by that square, has

been used in the drill service. In order to make this frequency number clearer, Table II, V, VIII, sample, page vi has been put in and the following plotted:

2 + 3 frequency of 19 4 + 6 frequency of 30.

Turning to this sample table on page vi it will be noted that opposite the figure two on the left hand side of the table and under the figure three at the top of the table there is a square that represents the combinations 2 + 3. The figure 19 in this square indicates that the combinations 2 + 3 has been used that many times in the drill work of this teaching group. If we do the same with the combination 4 + 6 it will be noted that it has been used 30 different times in the drill work covered by this table.

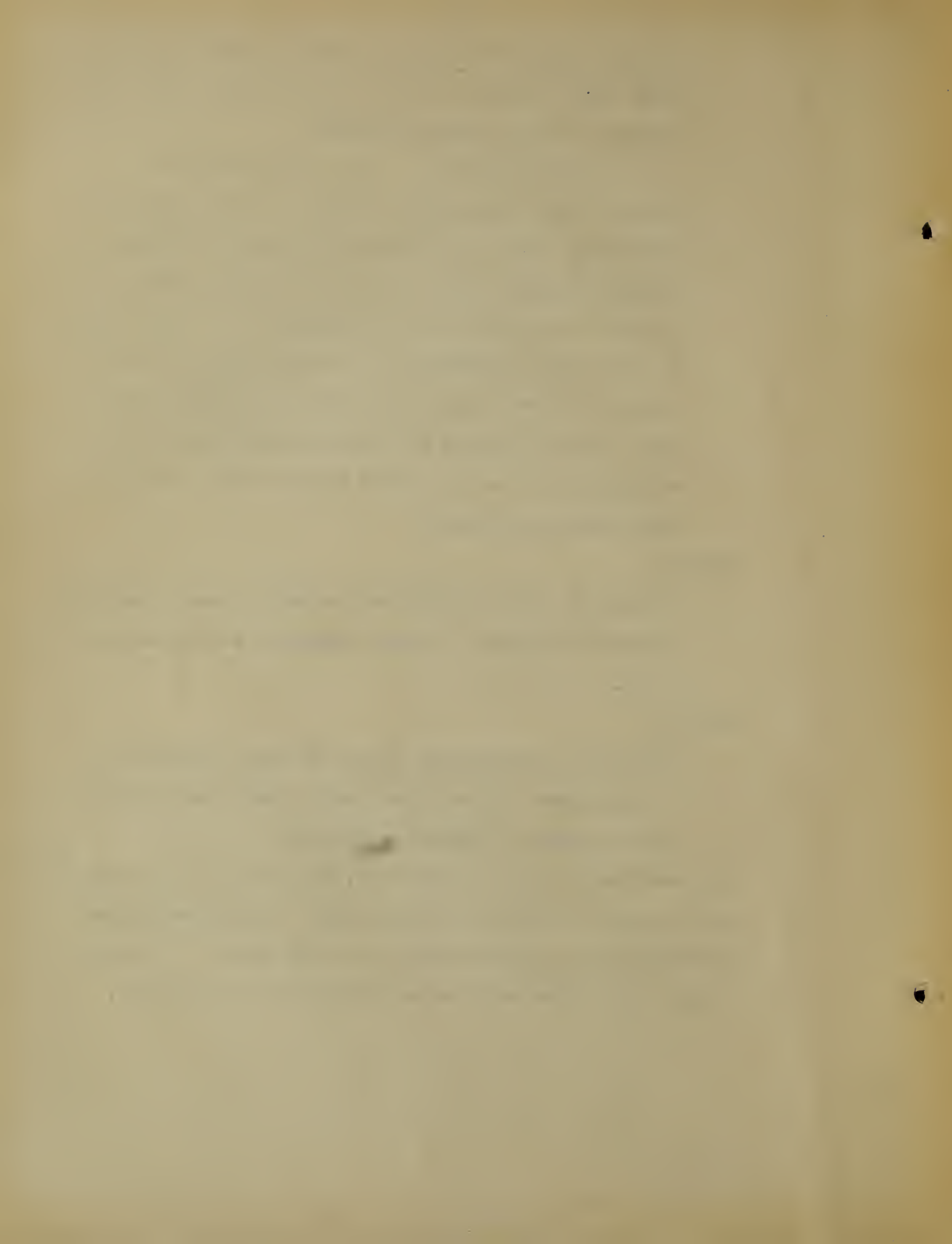
PART "B"

This part is really a continuation of part "A" and is tabulated in the very same way. It covers the decade combinations up to 39 + 9.

PART "C"

This part is a continuation of part "B" and is tabulated in the same manner. It covers the decade combinations above 39 + 9 that are needed in carrying in addition.

The third table, which is numbered III, VI, and IX in the respective drill analysis is called the useless table. It contains the combinations that are beyond business and social usage. It is really a part of the second table and is tabulated in the same manner.



* Group SAMPLE TABLE I, IV, VII

Primary or First Decade Facts

A									
2									
0	0	0	0	0	0	0	0	0	0
1									
1	1	1	1	1	1	1	1	1	1
2									
2	2	2	2	2	2	2	2	2	2
4									
3	3	3	3	3	3	3	3	3	3
4									
4	4	4	4	4	4	4	4	4	4
5									
5	5	5	5	5	5	5	5	5	5
6									
6	6	6	6	6	6	6	6	6	6
7									
7	7	7	7	7	7	7	7	7	7
8									
8	8	8	8	8	8	8	8	8	8
9									
9	9	9	9	9	9	9	9	9	9
1									
1	2	3	4	5	6	7	8	9	
2									
2	3	4	5	6	7	8	9		
3									
3	4	5	6	7	8	9			
4									
4	5	6	7	8	9				
5									
5	6	7	8	9					
6									
6	7	8	9						
7									
7	8	9							
8									
8	9								
9									
9									

[illegible]

	C							
+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.

Group SAMPLE TABLE II, V, VIII

Color for Examples, Black

Color for Problems, Red

A

[illegible]

B

[illegible]

+	0	1	2	3	4	5	6	7	8	9
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
	0	1	2	3	4	5	6	7	8	9

C

40							
42							
45							
48							
49							
54							
56							
63							
64							
72							
81							

THE FOLLOWING DRILL ANALYSIS COVERS THE ADDITION DRILL
AND THE ADDITION COMBINATIONS USED IN MULTIPLICATION
AND PROVING SUBTRACTION IN THE FIRST 186 PAGES OF

IROQUOIS ARITHMETIC

Book I

published by

IROQUOIS PUBLISHING COMPANY

Syracuse, N. Y. 1927

Analysis of the Addition in the Iroquois Arithmetic

Book I.

Purpose

This analysis is for the purpose of finding out the following:

1. The teaching groups.
2. The number of combinations taught and their frequency.
3. Whether the facts taught precede their occurrence in examples.
4. The process steps taught.
5. Whether the process steps taught precede their occurrence in examples.

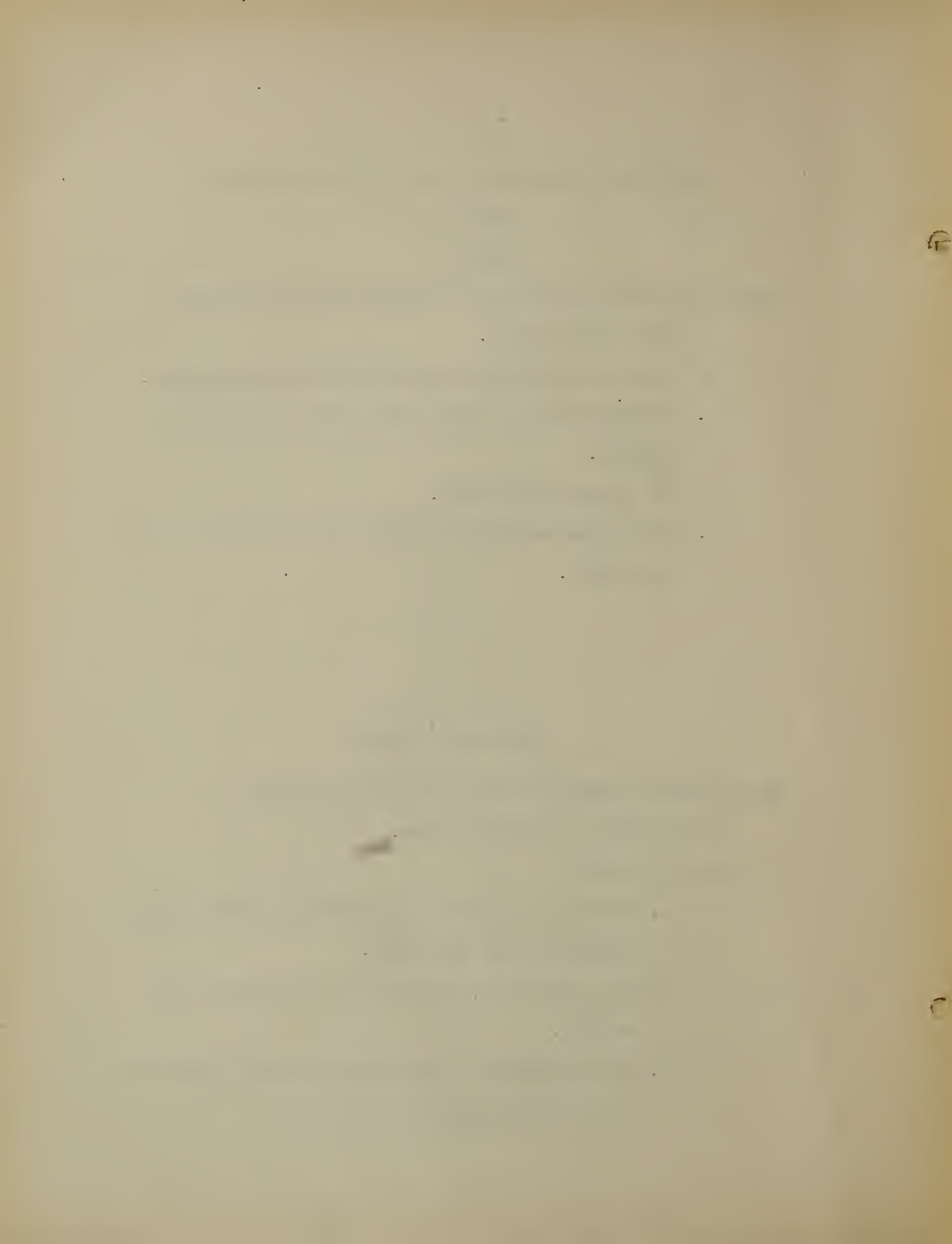
Explanation of Method

Three different tables are used for each teaching group.

Table I shows the teaching groups.

Table II shows:

1. The frequency of these combinations in drill examples and problems for this group.
2. The combinations, if any, that have preceded group teaching.
3. The combinations, if any, that have been studied and have not been included in drill work.



In this table the combinations are tabulated in three groups:

- A. The 100 primary combinations,
- B. The 300 decade combinations to 39 plus 9,
- C. The 80 combinations needed for carrying in multiplication.

Table III shows the combinations, if any, beyond the limits of those needed for social and business usage, namely, those from 40 plus 1 to 9, to 99 plus 1 to 9 with the exception of those needed for carrying in multiplication, which have already been recorded in table II.

Pages 1 to 13 inclusive contains counting, games, exercises, etc., used as introductory work to show the pupil the uses of number and a need for knowing combinations and processes. Since the work is introductory to the teaching group, Table I is omitted. The combinations used are recorded in Table II, the primary in group "A" which are read from left to top as: $\begin{array}{ccc} 0 & 1 & 2 \\ \hline 0 & 0 & 0 \end{array}$; the decade in group "B" which are read from left to top as: $\begin{array}{ccc} & & \\ 0 & 1 & 2 \\ \hline 11 & 12 & 13 \end{array}$. The number of marks in each square indicates the frequency of use of the combination represented by the square. The black mark indicates combinations used in examples and the red combinations used in problems.

The work in this group being introductory is omitted in the summary.

Analysis of Examples and Problems Used in Teaching Situations

Group Introduction to Group I
Iroquois, Pages 1 - 13

TABLE II
INTRODUCTORY

Color for Examples, Black

Color for Problems, Red

A

	0	1	2	3	4	5	6	7	8	9
0		1	1	1	1	1	1			
1	1	1	2 1	2	2	2	2	1	1	1
2	1	3	3	3	2	3	2			
3	1	3	8	4	1	1				
4	1	4 1	4 1	1 1	3	1 1	2			
5	1	8 1	3 4	2 2	1 2	3 2				
6	1	3	4 1	2 2						
7		2	1 3							
8		2								
9		2								

B

[illegible]

+	0	1	2	3	4	5	6	7	8	9
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
	0	1	2	3	4	5	6	7	8	9

C

40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

Group I and Drill

Group I, page 14 in the text, includes the primary combinations which have a sum of 10:

5	4	3	2	1	6	7	8	9
<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>

These are shown in red in Table I-A. They are read from the bottom up as $\begin{matrix} 9 & 8 & 7 \\ \underline{1} & \underline{2} & \underline{3} \end{matrix}$. (Page 5)

Group I also contains the decade combinations, 14+6, 24+6; 13+7, 23+7; 12+8, 22+8; 19+1, 29+1. These are shown in red in Table I-B. They are read from left to top as: 12+8, 14+6 etc. (Page 5)

The drill work for this group which is found in the arithmetic, pages 14 - 28, is tabulated in Table II, page 6. The red triangles placed in the squares indicate the combinations included in this teaching group. That is, they are the combinations shown in Table I, page 5. They are the only combinations which should be used since they are the only ones which have been taught.

Results of Tabulations of Group I

Table II-A, section I, page 6 shows that:

9 primary facts have been taught

47 primary facts are used which have not been taught.

Table II-B, section I shows that:

8 decade facts have been taught

43 decade facts are used which have not been taught.

- 5 -
TABLE I SECTION I

TEACHING GROUPS

* Group I, Iroquois Arithmetic, page 14.

Numbers having a sum of 10

Primary or First Decade Facts

B

A

0 0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9
1 1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9
2 2 2 2 2 2 2 2 2	3 4 5 6 7 8 9
3 3 3 3 3 3 3 3	4 5 6 7 8 9
4 4 4 4 4 4 4	5 6 7 8 9
5 5 5 5 5 5	6 7 8 9
6 6 6 6 6	7 8 9
7 7 7	8 9
8 8	9
9	

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12									8	
13								7		
14						6				
15										
16										
17										
18										
19		1								
20										
21										
22									8	
23								7		
24						6				
25										
26										
27										
28										
29		1								
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.

ADDITION

Facts used in drill material for Group I

Group I, Pages 14 - 28, Iroquois

Color for Examples, Black

Color for Problems, Red

TABLE II, SECTION I

	0	1	2	3	4	5	6	7	8	9
0				2	2	1	2	1		1
1		10 1	7 2	5	5 1	4	2	3	7	9 2
2		4	4	2	4	3	2	2	12 1	
3	1	4	1	5	1	2	8	15		
4	1	2	1	2	8	4	11			
5		1	1	2	7	19 1				
6	1	7	2	5	8					
7		2	4	7						
8	2	7	7							
9	2	13 2								

	0	1	2	3	4	5	6	7	8	9
+	0	1	2	3	4	5	6	7	8	9
10	1	7	5	5	4	14 1	8	12	5	11
11										7
12									7	
13								4		
14							5			
15						10 1				
16					9					
17				10 1						
18			8							
19		6								
20	1	6	5	2	3	9	3	7	3	3
21		1								5
22		1							7	
23								2		
24		1					2 1			

+	0	1	2	3	4	5	6	7	8	9
25						8				
26					3					
27				5						
28			2							
29		2								
30		1	1		1	1	7	2	2	2
31										
32										
33										
34										
35						1				
36					2					
37										
38										
39										
	0	1	2	3	4	5	6	7	8	9

				C				
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

Group II and Drill

Group II, Iroquois Arithmetic, page 29 includes the doubles:

9	8	7	6	5	4	3	2	1
<u>9</u>	<u>8</u>	<u>7</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>

These are shown in red, Table I-A, page 8. The first teaching group is also shown in this table but tabulated in black.

The drill work for this group, Iroquois Arithmetic pages 29-33, is tabulated in Table II-A, B, C, section II, page 9. The combinations in Table C indicate those needed for carrying in multiplication beyond $39 + 9$. The combinations beyond $39 + 9$ with the exception of those needed for carrying in multiplication are tabulated in Table III, page 11. The black triangles in Table II indicate the combinations previously taught.

Results of Tabulations of Group II

Table II-A, section II, page 9 shows that:

17 primary facts have been taught,

10 primary facts are used which have not been taught.

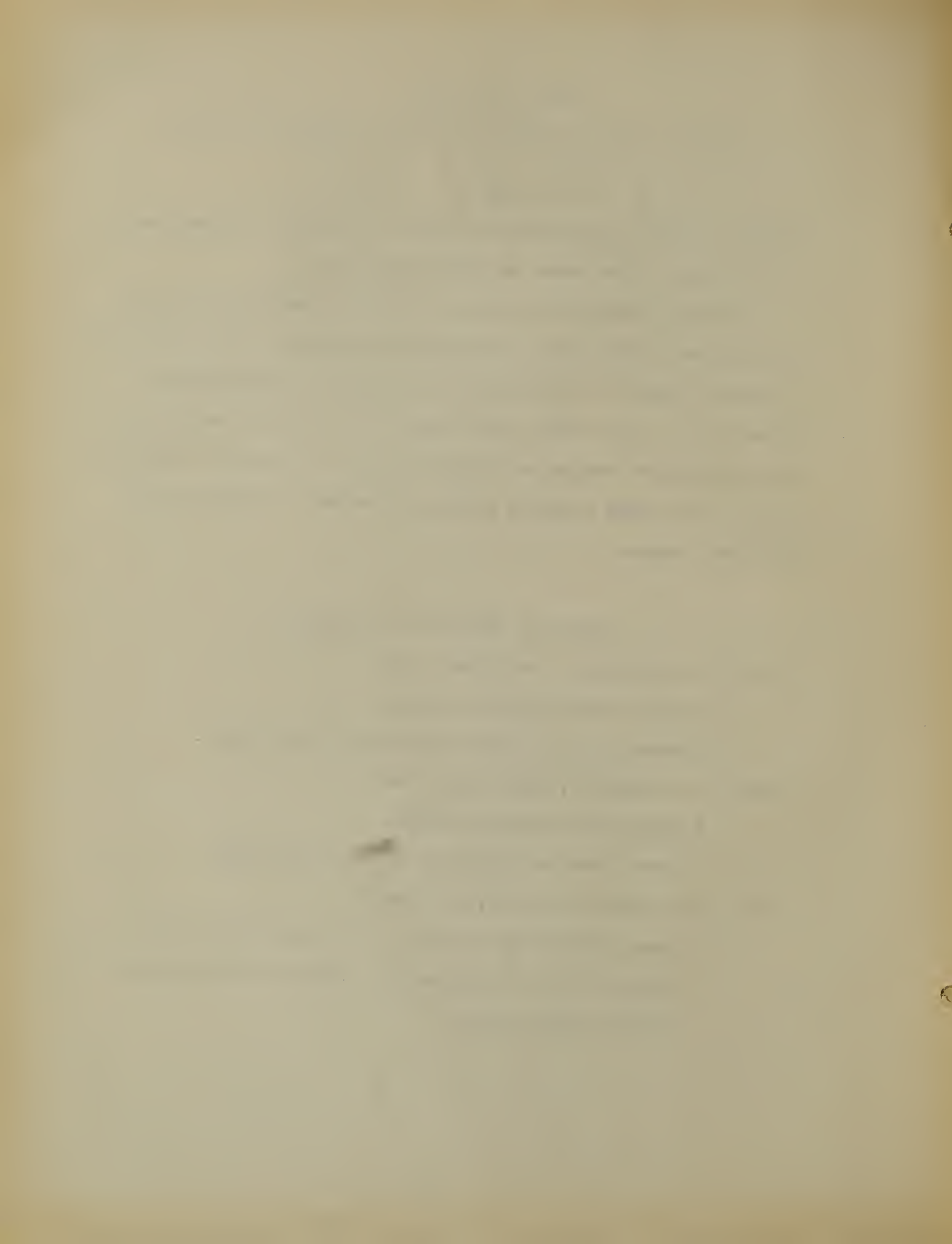
Table II-B, section II, page 9 shows that:

8 decade facts have been taught,

72 decade facts are used which have not been taught.

Table III, section II, page 10, shows that:

17 decade combinations beyond $39 + 9$ are used. These combinations have not been taught. Furthermore they are beyond the limits of use.



-8-
TABLE I SECTION II
TEACHING GROUPS

* Group II, Page 29, Doubles

Iroquois

Primary or First Decade Facts

A										
0	0	0	0	0	0	0	0	0	0	1 2 3 4 5 6 7 8 9
1	1	1	1	1	1	1	1	1	1	2 3 4 5 6 7 8 9
2	2	2	2	2	2	2	2	2	2	3 4 5 6 7 8 9
3	3	3	3	3	3	3	3	3	3	4 5 6 7 8 9
4	4	4	4	4	4	4	4	4	4	5 6 7 8 9
5	5	5	5	5	5	5	5	5	5	6 7 8 9
6	6	6	6	6	6	6	6	6	6	7 8 9
7	7	7	7	7	7	7	7	7	7	8 9
8	8	8	8	8	8	8	8	8	8	9
9	9	9	9	9	9	9	9	9	9	

B	+	0	1	2	3	4	5	6	7	8	9
10											
11											
12										8	
13									7		
14								6			
15											
16											
17											
18											
19		1									
20											
21											
22										8	
23									7		
24								6			
25											
26											
27											
28											
29		1									
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											

C	+	1	2	3	4	5	6	7	8
40									
42									
45									
48									
49									
54									
56									
63									
64									
72									
81									

* New group in red,
Cumulative groups in black.

Table 1	
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
25	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

Table 2	
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
25	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100



Facts used in Drill Material for Group II

Group II, Pages 29 - 33 Iroquois

Color for Examples, Black

TABLE II Section II

Color for Problems, Red

Doubles

A

	+	0	1	2	3	4	5	6	7	8	9
0											
1			4 3	1						1	4
2				11		1				4	
3			2		10				4		
4				1							
5	1	1				13		6			
6							6				
7	1					3		14			
8					1			1		9	
9				7						13	
+			1								16

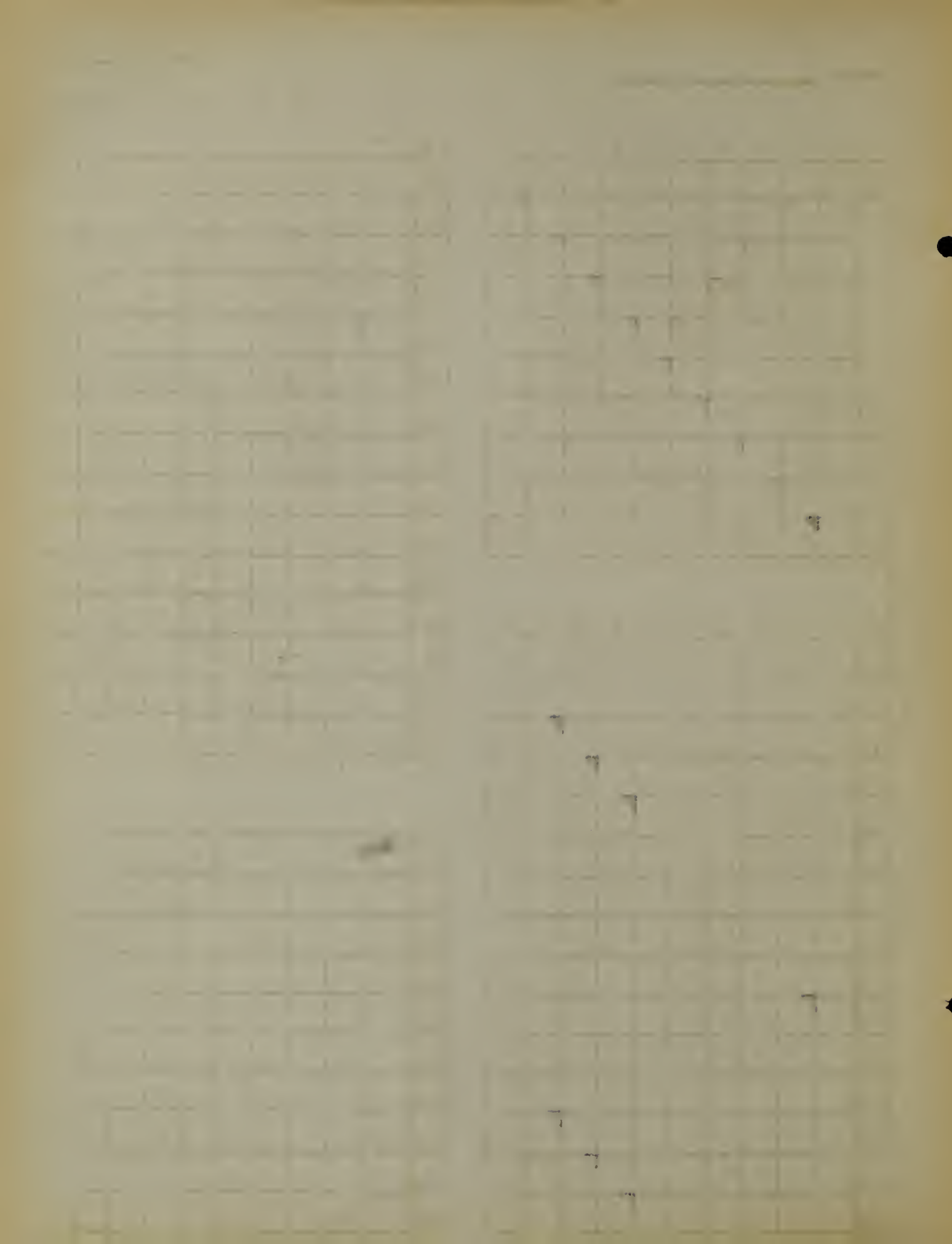
B

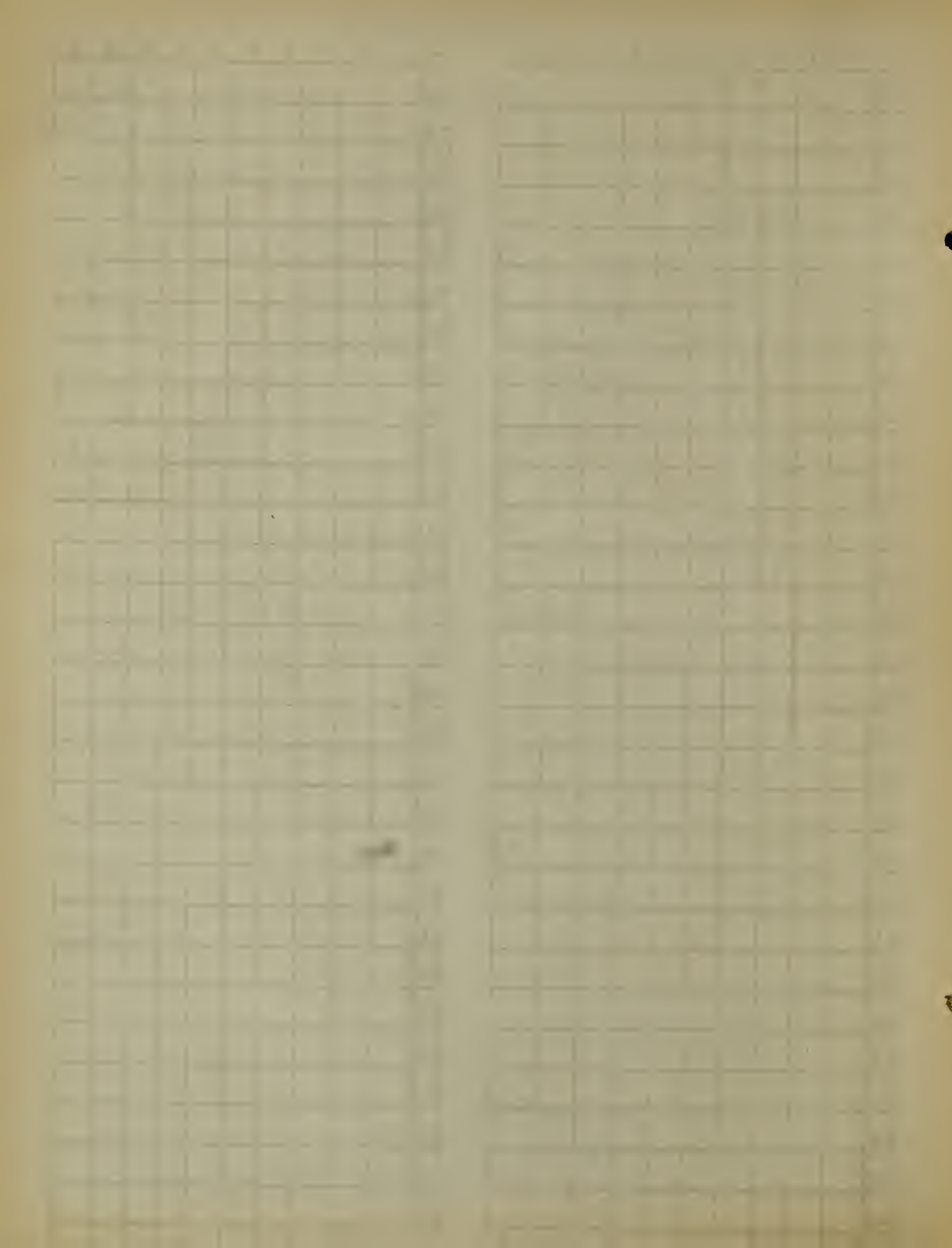
	0	1	2	3	4	5	6	7	8	9
10		2	7	5	5	1	6	2	5	3
11		1								2
12			4						15	
13				4				2		
14					9		7			
15										
16	1	3			7		7			1
17				2				4		
18			12						12	
19		1								3
20		4	4	9	8	5	8	3	4	3
21										2
22		1	3						2	
23				4				4		
24					8		4			

[illegible]

C

40		1	1	2	2	1	1	3
42								
45								
48								
49								
54					1			
56							1	
63				1				
64								
72								
81								





Group III and Drill

Group III, Iroquois Arithmetic, page 34 includes the numbers whose sums are 9:

1	3	4	2	8	6	5	7	9	0
<u>8</u>	<u>6</u>	<u>5</u>	<u>7</u>	<u>1</u>	<u>3</u>	<u>4</u>	<u>2</u>	<u>0</u>	<u>9</u>

These are shown in red, Table I-A, section III, page 12. The preceding groups are shown in black. Table I is cumulative always showing every combination which has been taught.

The drill work for this group, Iroquois Arithmetic pages 34 - 40, is tabulated in Table II-A, B, C, section III, page 13 and Table III, section III, page 14.

Results of Tabulations of Group III

Table II-A, section III, page 13, shows that:

27 primary facts have been taught,

1 primary fact is used which has not been taught

Table II-B, section III, page 13, shows that:

8 decade facts have been taught,

24 decade facts are used which have not been taught.

Table II-C, section III, page 13, shows that:

0 facts needed for carrying in multiplication have been taught,

1 has been used.

Table III, section III, page 14, shows that

0 decade combinations beyond 39+9 have been used.

- 12 -
TABLE I, Section III
TEACHING GROUPS

* Group III, Iroquois Arithmetic, page 34

Numbers whose sums are 9

Primary or First Decade Facts

A									
0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

B	+	0	1	2	3	4	5	6	7	8	9
10											
11											
12										8	
13									7		
14								6			
15											
16											
17											
18											
19		1									
20											
21											
22										8	
23									7		
24								6			
25											
26											
27											
28											
29		1									
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											

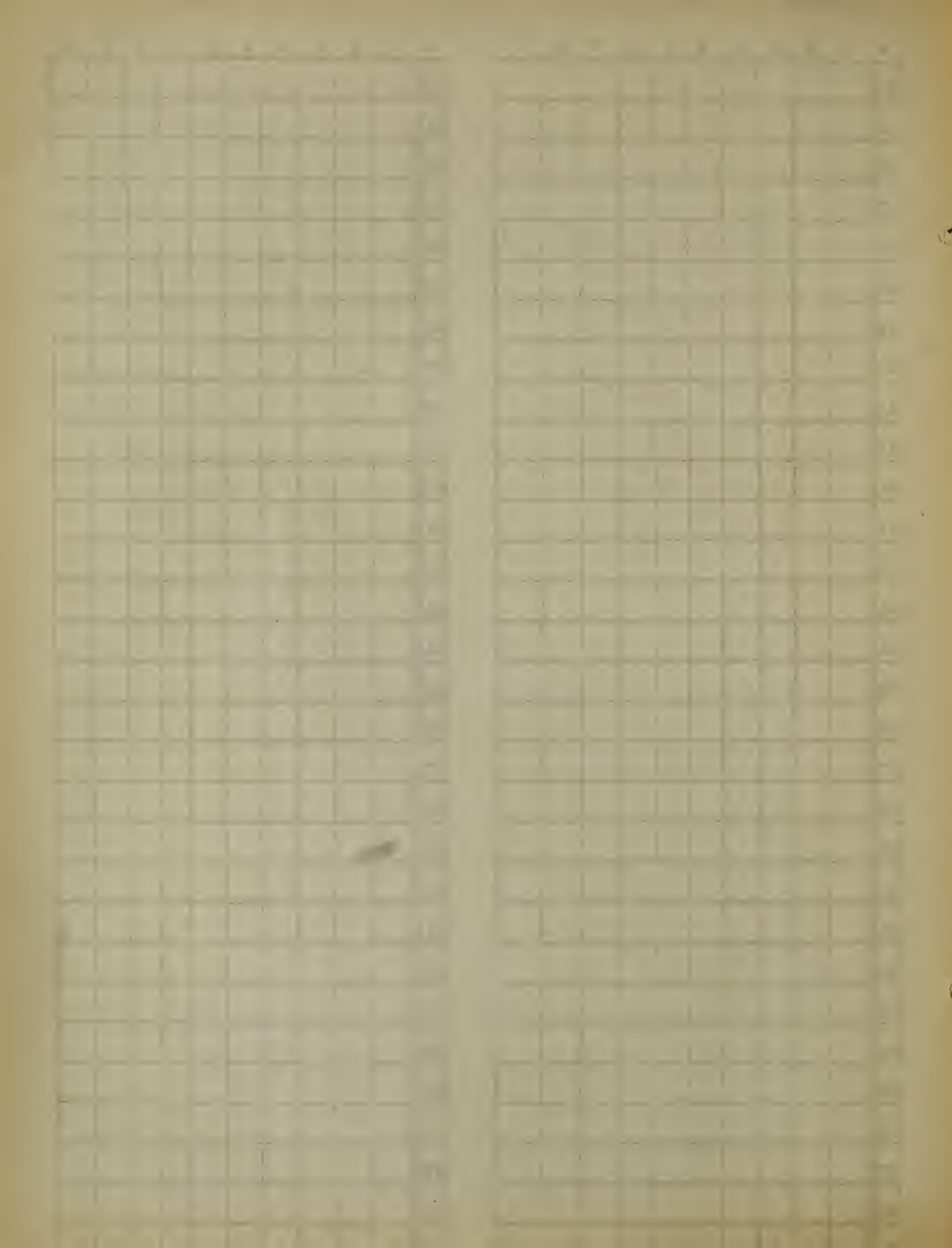
C	+	1	2	3	4	5	6	7	8
40									
42									
45									
48									
49									
54									
56									
63									
64									
72									
81									

* New group in red,
Cumulative groups in black.

Color for Examples, Black

Color for Problems, Red

				C				
40								
42								
45				1				
48								
49								
54								
56								
63								
64								
72								
81								



Group IV and Drill

Group IV, Iroquois Arithmetic, page 41, includes the numbers whose sums are 8:

7	5	6	1	3	2	8	4
<u>1</u>	<u>3</u>	<u>2</u>	<u>7</u>	<u>5</u>	<u>6</u>	<u>0</u>	<u>4</u>

These are shown in red, Table I-A, section IV, page 16.

The drill work for this group, Iroquois Arithmetic, pages 41 - 44, is tabulated in Table II-A, B, C, section IV, page 17 and in Table III, section IV, page 18.

Results of Tabulations of Group IV

Table II-A, section IV, page 17 shows that:

34 primary facts have been taught

6 primary facts are used which have not been taught

1 primary fact is taught which is not used in drill

Table II-B, section IV, page 17 shows that:

8 decade facts have been taught,

58 decade facts are used which have not been taught.

Table II-C, section IV, page 17 shows that:

0 facts needed for carrying in multiplication have been taught.

1 has been taught.

Table III, section IV, page 18, shows that:

2 decade combinations beyond 39+9 and not needed for carrying in multiplication have been used.



TEACHING GROUPS

* Group IV, Iroquois, Page 41

Numbers whose sums are 8

Primary or First Decade Facts

A									
8 9									
0	0	0	0	0	0	0	0	0	0
1 7 8 9									
1	1	1	1	1	1	1	1	1	1
2 6 7 8									
2	2	2	2	2	2	2	2	2	2
3 5 6 7									
3	3	3	3	3	3	3	3	3	3
4 5 6									
4	4	4	4	4	4	4	4	4	4
5									
5	5	5	5	5	5	5	5	5	5
6									
6	6	6	6	6	6	6	6	6	6
7									
7	7	7	7	7	7	7	7	7	7
8									
8	8	8	8	8	8	8	8	8	8
9									
9	9	9	9	9	9	9	9	9	9

B									
+	0	1	2	3	4	5	6	7	8
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									

C							
+	1	2	3	4	5	6	7
40							
42							
45							
48							
49							
54							
56							
63							
64							
72							
81							

* New group in red,
Cumulative groups in black.

Table with multiple columns and rows, containing handwritten entries. The table is partially obscured by a large, faint, handwritten 'X' or similar mark.

Table with multiple columns and rows, containing handwritten entries. This table is located below the first table and is also partially obscured by the large, faint, handwritten mark.



Facts Used in Drill Material for Group IV

Group IV, Iroquois, Pages 41 -44

Color for Examples, Black

TABLE II, Section IV

Color for Problems, Red

[illegible]

+	0	1	2	3	4	5	6	7	8	9
25					3	2				
26					3		3			
27			1					2		
28		1	3						1	
29		6								4
30		1		1	2	3		2	2	
31										
32									2	
33										
34						4				
35					2					
36				1						
37		1		1						
38										
39										4
	0	1	2	3	4	5	6	7	8	9

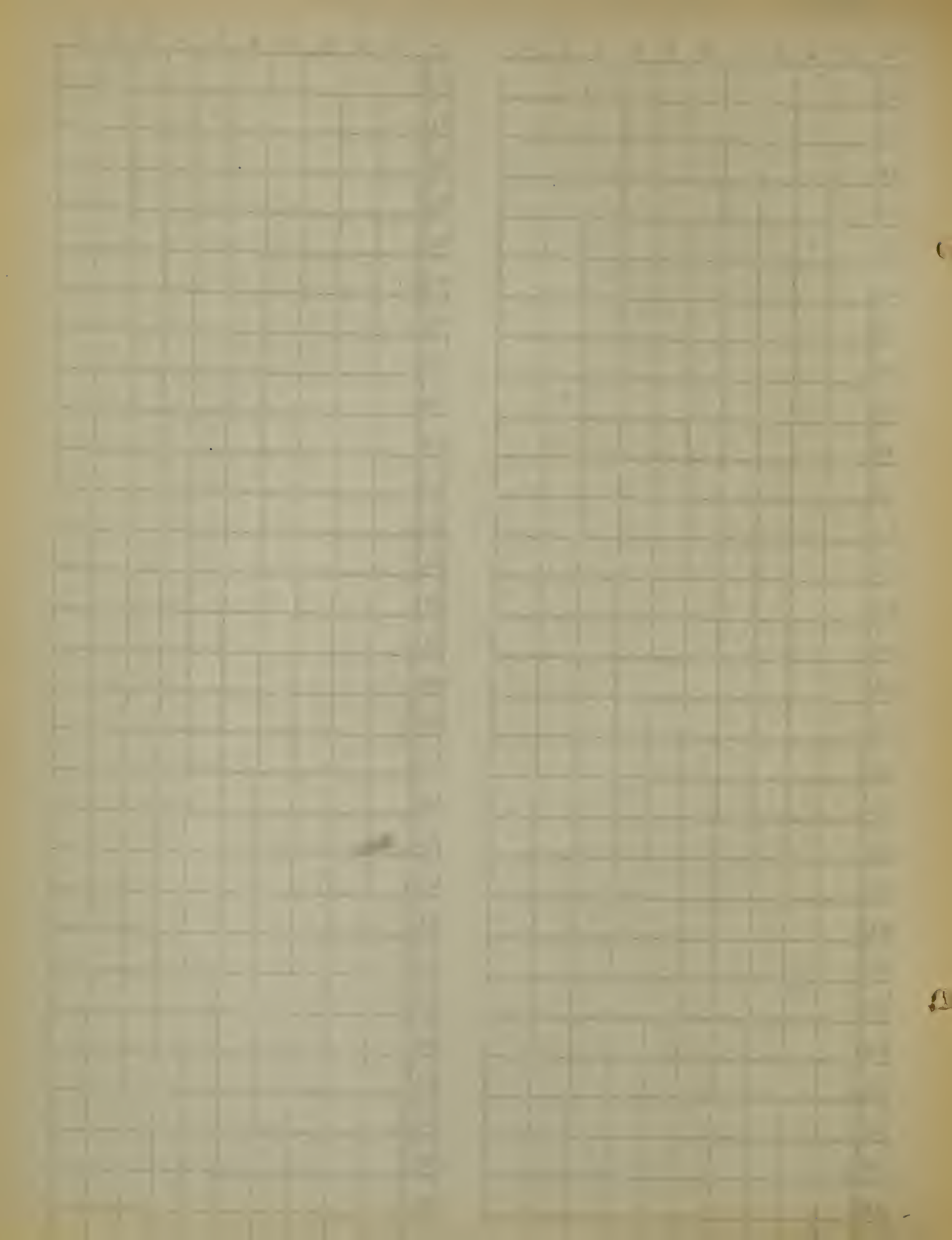
	B									
+	0	1	2	3	4	5	6	7	8	9
10	1	4	2	2	2	4	3	3	3	3
11								3	1	2
12	1					1	1		3	
13						2				
14					2		1			
15						4				
16			6	1	5		4			
17		1				1				
18		2	10						9	
19		3								3
20					3	4	2	4	4	5
21										
22									3	
23										
24		1				2				

C				
40			1	
42				
45				
48				
49				
54				
56				
63				
64				
72				
81				

Facts beyond 39 + 9 Used in Drill Material for Group IV.

TABLE III, Section IV

[illegible][illegible]



Group V and Drill

Group V, Iroquois Arithmetic, page 45, includes the numbers whose sums are 7 or 17:

9	4	5	6	8	3	2	1	7
<u>8</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>9</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>0</u>

These are shown in red, Table I-A, section V, page 20.

The drill work for this group, Iroquois Arithmetic, pages 44 - 53, is tabulated in Table II-A, B, C, section V, page 21 and Table III, section V, page 22.

Results of Tabulations of Group V

Table II-A, section V, page 21 shows that:

43 primary facts have been taught,

2 primary facts are used which have not been taught.

Table II-B, section V, page 21, shows that:

8 decade facts have been taught,

33 decade facts are used which have not been taught.

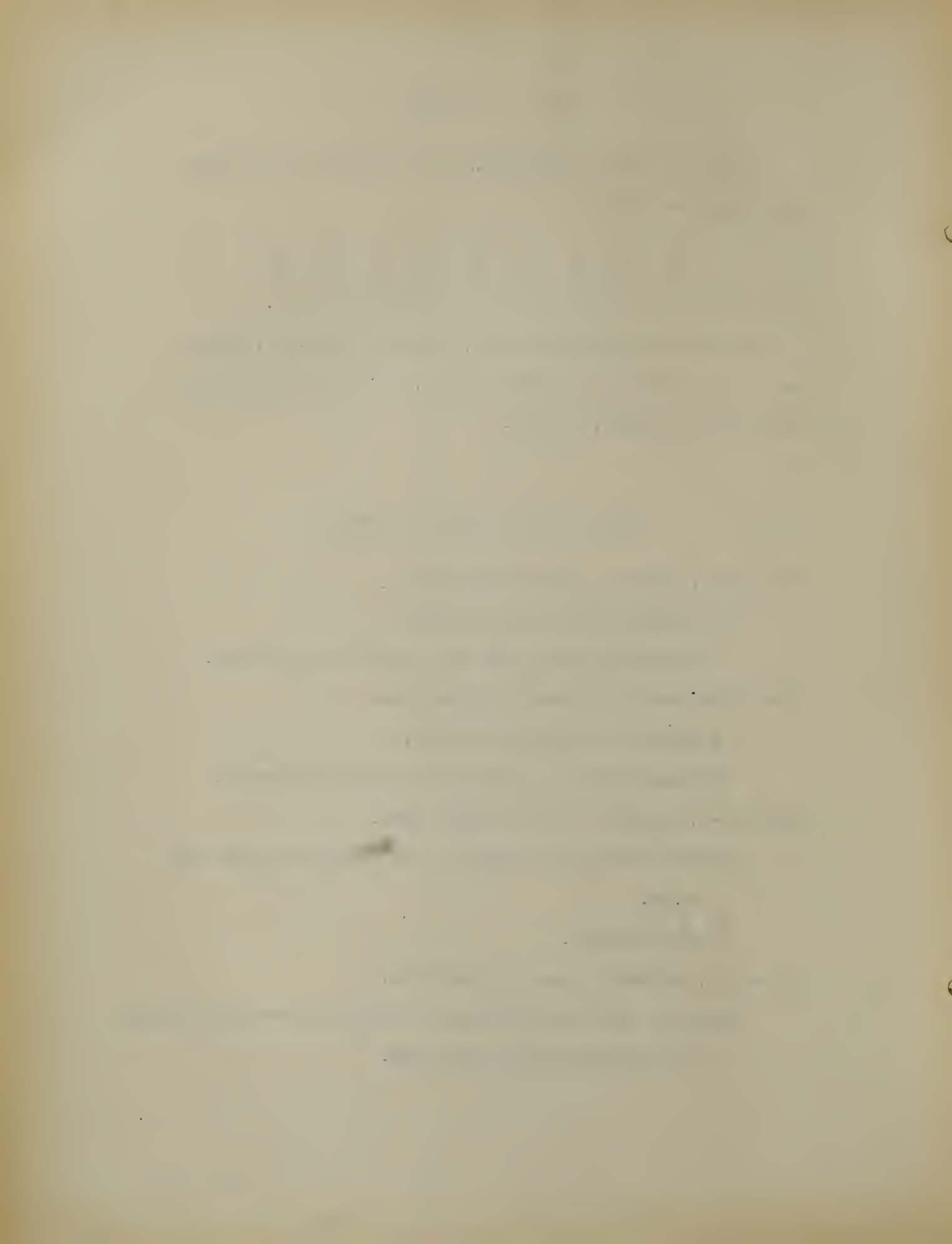
Table II-C, section V, page 21, shows that:

0 facts needed for carrying in multiplication have been taught.

2 have been used.

Table III, section V, page 22, shows that:

13 decade combinations beyond 39+9 and not needed for carrying in multiplication have been used.



* Group V, Iroquois, Page 45

Primary or First Decade Facts

A

[illegible]

B

[illegible]

C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

100

100

100

100

100

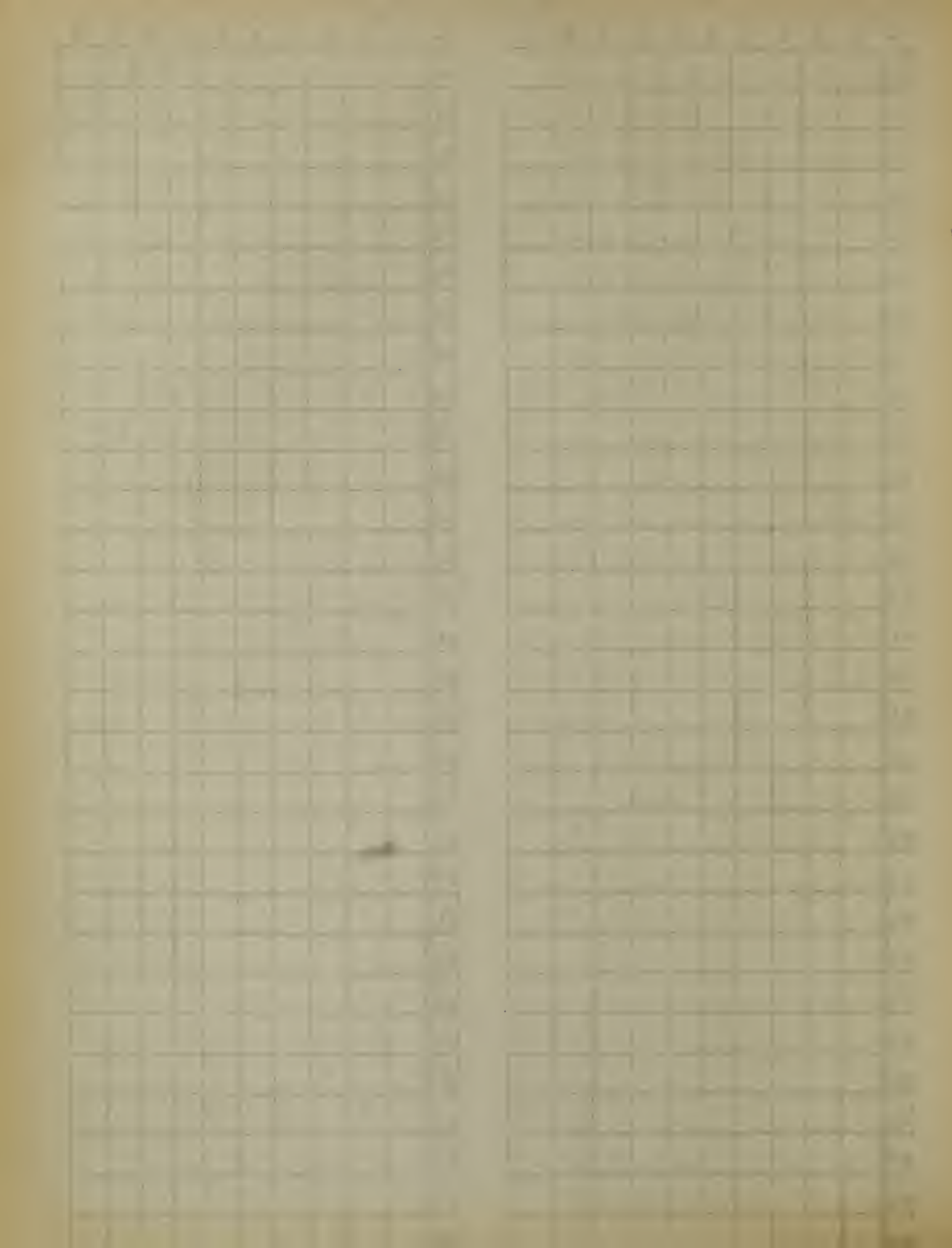
100

100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

TABLE III, Section V

[illegible][illegible]



Group VI and Drill

Group VI, Iroquois Arithmetic, page 54, includes the numbers whose sums are 6 or 16, 5 or 15, 4 or 14, 3 or 13, 2 or 12, 1 or 11. These facts are shown in Table I, section VI, page 24.

The drill work for this group, Iroquois Arithmetic, pages 55 - 67 is tabulated in Table II- A, B, C, section VI page 25, and Table III, section VI, page 26.

Beginning with this group another tabulation is added which shows the addition combinations used in proving subtraction. These tabulations are recorded in black, Table IV-A, section VI, page 27.

Results of Tabulations of Group VI

Table II-A, section VI, page 25, shows that:

94 primary facts have been taught,

6 primary facts have been used which have not been taught.

Table II-B, section VI, page 25, shows that:

8 decade facts have been taught,

24 decade facts have been used which have not been taught.

Table III-section VI, page 26, shows that:

2 decade combinations beyond $39+9$ and not needed for carrying in multiplication have been used.

Table IV-A, section VI, page 27 shows the 30 primary combinations used in proving subtraction.



TEACHING GROUPS

* Group VI, Iroquois, Page 54

Numbers whose sums are 5 or 15,
6 or 16, 4 or 14, 3 or 13, 2 or
12, 1 or 11.

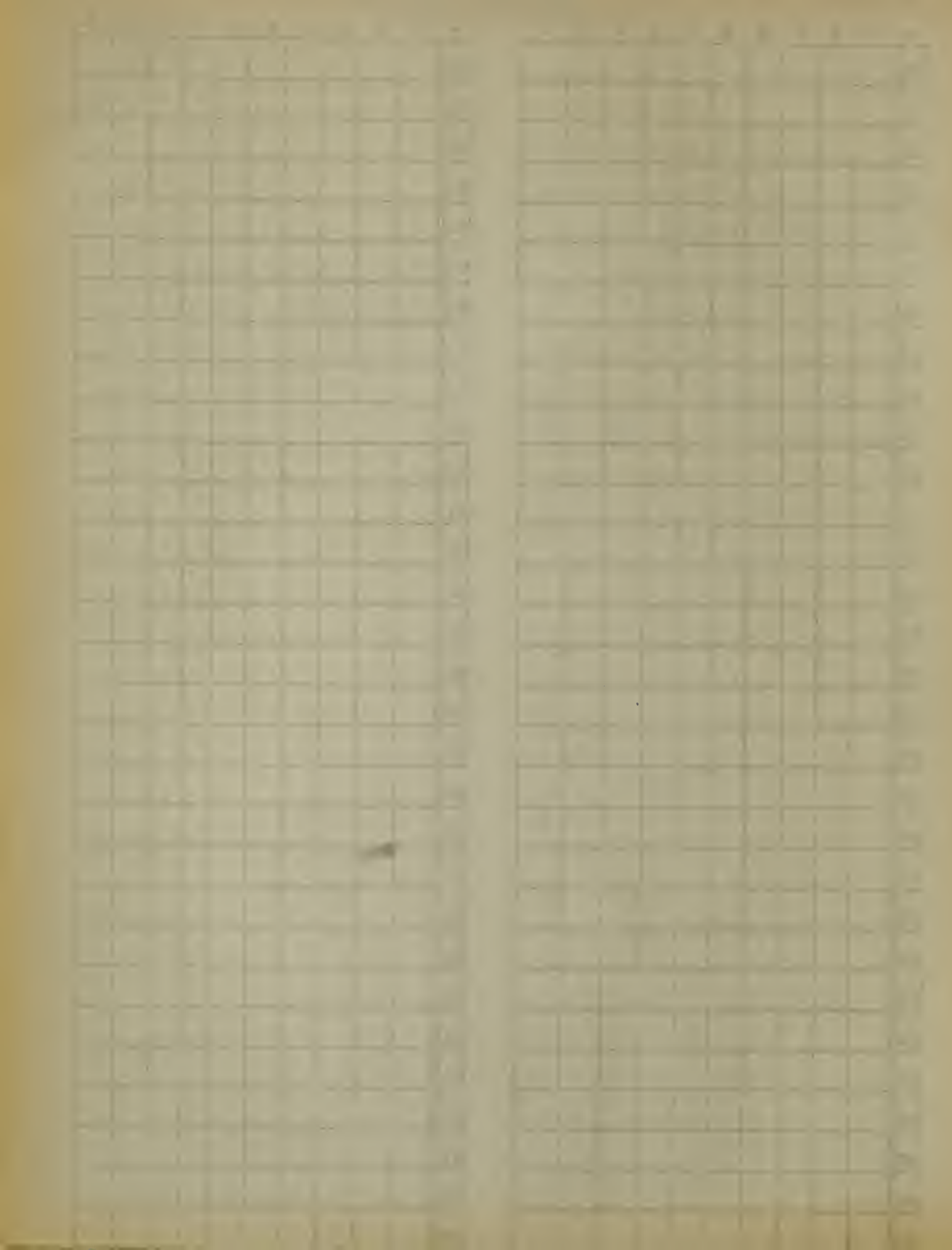
Primary or First Decade Facts

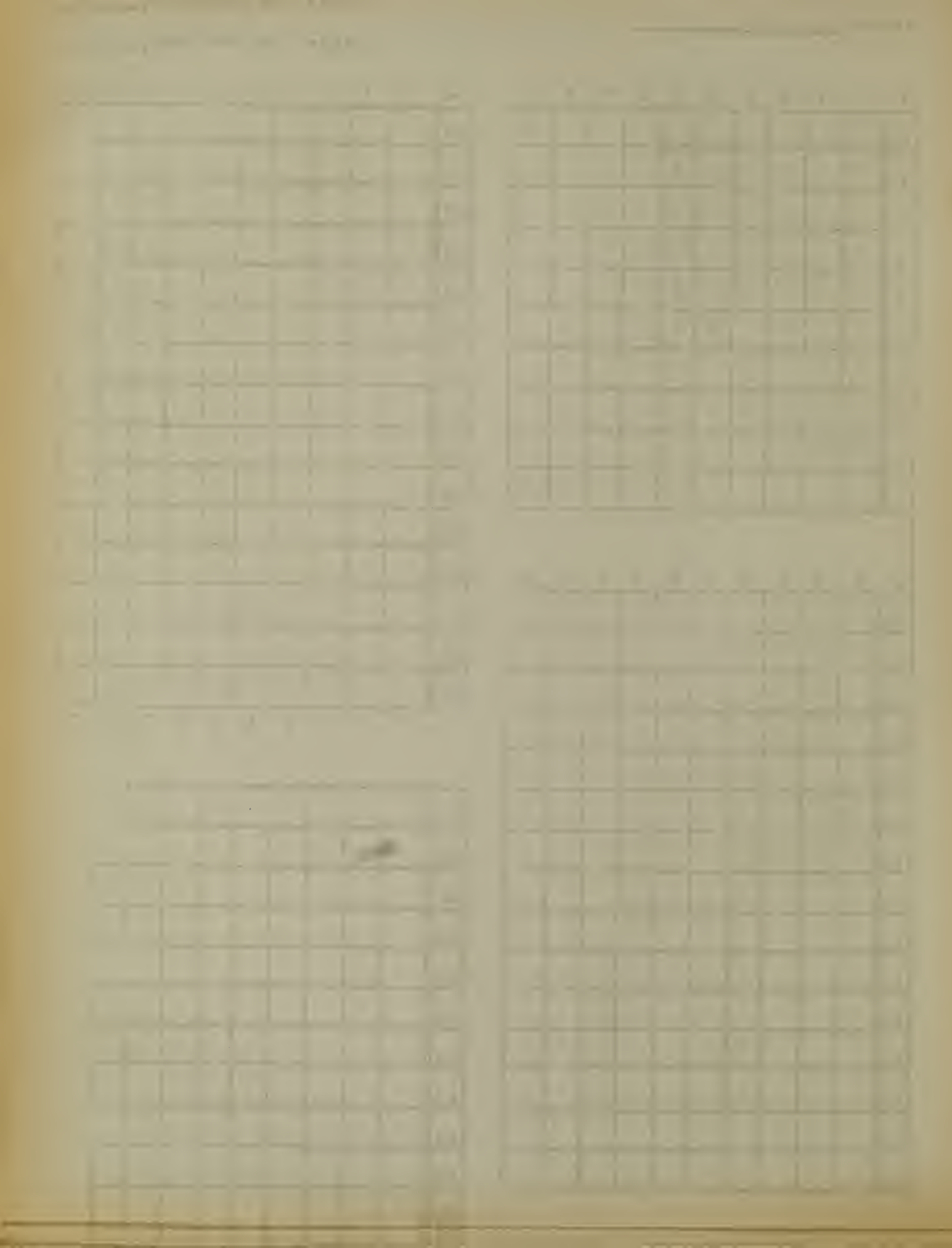
A									
1	2	3	4	5	6	7	8	9	
0	0	0	0	0	0	0	0	0	0
1	2	3	4	5	6	7	8	9	
1	1	1	1	1	1	1	1	1	1
2	3	4	5	6	7	8	9		
2	2	2	2	2	2	2	2	2	2
3	4	5	6	7	8	9			
3	3	3	3	3	3	3	3	3	3
4	5	6	7	8	9				
4	4	4	4	4	4	4	4	4	4
5	6	7	8	9					
5	5	5	5	5	5	5	5	5	5
6	7	8	9						
6	6	6	6	6	6	6	6	6	6
7	8	9							
7	7	7	7	7	7	7	7	7	7
8	9								
8	8	8	8	8	8	8	8	8	8
9									
9									

B										
+	0	1	2	3	4	5	6	7	8	9
10										
11										
12									8	
13								7		
14							6			
15										
16										
17										
18										
19		1								
20										
21										
22									8	
23								7		
24							6			
25										
26										
27										
28										
29		1								
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

C								
+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.





Group VII and Drill

Group VII, Iroquois Arithmetic, page 68, includes the numbers whose sums are 6 or 16:

2	1	4	5	6	3	7	9	8
<u>4</u>	<u>5</u>	<u>2</u>	<u>1</u>	<u>0</u>	<u>3</u>	<u>9</u>	<u>7</u>	<u>8</u>

The above combinations are a review group. Such groups are represented in Table II- A, by a black triangle having a red hypotenuse.

The drill work for this group, Iroquois Arithmetic, pages 68 - 79, is tabulated in Table II-A, B, C, section VII, page 30 and Table III, section VII, page 31.

Beginning with this group another tabulation is added which shows the addition combinations used in carrying in multiplication. These tabulations are recorded in red, Table V-A, B, section VII, page 32.

Results of Tabulations of Group VII

Table II-A, section VII, page 30 shows that:

94 primary facts have been taught

2 facts are used which have not been taught.

Table II-B, section VII, page 30 shows that:

8 decade facts have been taught,

39 decade facts are used which have not been taught.

Table II-C, section VII, page 30 shows that:

0 facts for carrying in multiplication have been taught.

1 fact is used.

Table III, section VII, page 31 shows that:

11 decade combinations beyond 39+9, and not needed for carrying in multiplication have been used.

Table V-,A, B, section VII, page 32 shows the 4 primary decade facts used in carrying in multiplication.

The first of these is the fact that the
the second is the fact that the
the third is the fact that the
the fourth is the fact that the
the fifth is the fact that the
the sixth is the fact that the
the seventh is the fact that the
the eighth is the fact that the
the ninth is the fact that the
the tenth is the fact that the
the eleventh is the fact that the
the twelfth is the fact that the
the thirteenth is the fact that the
the fourteenth is the fact that the
the fifteenth is the fact that the
the sixteenth is the fact that the
the seventeenth is the fact that the
the eighteenth is the fact that the
the nineteenth is the fact that the
the twentieth is the fact that the
the twenty-first is the fact that the
the twenty-second is the fact that the
the twenty-third is the fact that the
the twenty-fourth is the fact that the
the twenty-fifth is the fact that the
the twenty-sixth is the fact that the
the twenty-seventh is the fact that the
the twenty-eighth is the fact that the
the twenty-ninth is the fact that the
the thirtieth is the fact that the
the thirty-first is the fact that the
the thirty-second is the fact that the
the thirty-third is the fact that the
the thirty-fourth is the fact that the
the thirty-fifth is the fact that the
the thirty-sixth is the fact that the
the thirty-seventh is the fact that the
the thirty-eighth is the fact that the
the thirty-ninth is the fact that the
the fortieth is the fact that the
the forty-first is the fact that the
the forty-second is the fact that the
the forty-third is the fact that the
the forty-fourth is the fact that the
the forty-fifth is the fact that the
the forty-sixth is the fact that the
the forty-seventh is the fact that the
the forty-eighth is the fact that the
the forty-ninth is the fact that the
the fiftieth is the fact that the
the fifty-first is the fact that the
the fifty-second is the fact that the
the fifty-third is the fact that the
the fifty-fourth is the fact that the
the fifty-fifth is the fact that the
the fifty-sixth is the fact that the
the fifty-seventh is the fact that the
the fifty-eighth is the fact that the
the fifty-ninth is the fact that the
the sixtieth is the fact that the
the sixty-first is the fact that the
the sixty-second is the fact that the
the sixty-third is the fact that the
the sixty-fourth is the fact that the
the sixty-fifth is the fact that the
the sixty-sixth is the fact that the
the sixty-seventh is the fact that the
the sixty-eighth is the fact that the
the sixty-ninth is the fact that the
the seventieth is the fact that the
the seventy-first is the fact that the
the seventy-second is the fact that the
the seventy-third is the fact that the
the seventy-fourth is the fact that the
the seventy-fifth is the fact that the
the seventy-sixth is the fact that the
the seventy-seventh is the fact that the
the seventy-eighth is the fact that the
the seventy-ninth is the fact that the
the eightieth is the fact that the
the eighty-first is the fact that the
the eighty-second is the fact that the
the eighty-third is the fact that the
the eighty-fourth is the fact that the
the eighty-fifth is the fact that the
the eighty-sixth is the fact that the
the eighty-seventh is the fact that the
the eighty-eighth is the fact that the
the eighty-ninth is the fact that the
the ninetieth is the fact that the
the ninety-first is the fact that the
the ninety-second is the fact that the
the ninety-third is the fact that the
the ninety-fourth is the fact that the
the ninety-fifth is the fact that the
the ninety-sixth is the fact that the
the ninety-seventh is the fact that the
the ninety-eighth is the fact that the
the ninety-ninth is the fact that the
the hundredth is the fact that the

- 29 -
TABLE I, Section VII

TEACHING GROUPS

* Group VII, Iroquois, Page 68

Numbers whose sums are 6 or 16

Primary or First Decade Facts

A

1 2 3 4 5 6 7 8 9	0 0 0 0 0 0 0 0 0	0 0 0 0 0	0
0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1	1
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9	2
1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9	2 2 2 2 2 2 2	3
2 3 4 5 6 7 8 9	2 2 2 2 2 2 2	3 4 5 6 7 8 9	4
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9	3 3 3 3 3 3	5
3 4 5 6 7 8 9	3 3 3 3 3 3	4 5 6 7 8 9	6
3 3 3 3 3 3 3	4 5 6 7 8 9	4 4 4 4 4	7
4 5 6 7 8 9	4 4 4 4 4	5 6 7 8 9	8
4 4 4 4 4 4	5 6 7 8 9	5 5 5 5	9
5 6 7 8 9	5 5 5 5	6 7 8 9	10
5 5 5 5 5	6 7 8 9	6 6 6	11
6 7 8 9	6 6 6	7 8 9	12
6 6 6 6	7 8 9	7 7	13
7 8 9	7 7	8 9	14
7 7 7	8 9	8	15
8 9	8	9	16
8 8	9		17
9			18
9			19

B

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12									8	
13								7		
14							6			
15										
16										
17										
18										
19		1								
20										
21										
22									8	
23								7		
24							6			
25										
26										
27										
28										
29		1								
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.

Color for Examples, Black

TABLE II, Section VII Color for Problems, Red

40							
42							
45							
48							
49							
54							
56							
63							
64							
72				1			
81							

Handwritten text in the left column, appearing to be a list or ledger with multiple entries.

Handwritten text in the right column, appearing to be a list or ledger with multiple entries.

Group VIII and Drill

Group VIII, Iroquois Arithmetic, Page 80, includes the numbers whose sums are 5 or 15:

<u>1</u>	<u>2</u>	<u>4</u>	<u>3</u>	<u>5</u>	<u>9</u>	<u>8</u>	<u>6</u>	<u>7</u>
<u>4</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>6</u>	<u>7</u>	<u>9</u>	<u>8</u>

These are shown in red, Table I, section VIII, page 34.

The drill work of this group, Iroquois, Arithmetic, pages 80 - 91, is tabulated in Table II-A, B, C, section VIII, page 35; Table III, section VIII, page 36; Table IV, section VIII, page 37; and Table V, section VIII, page 38.

Results of Tabulations of Group VIII

Table II-A, section VIII, page 35 shows that:

94 primary facts have been taught,

2 facts are used which have not been taught.

Table II-B, section VIII, page 35, shows that:

8 decade facts have been taught,

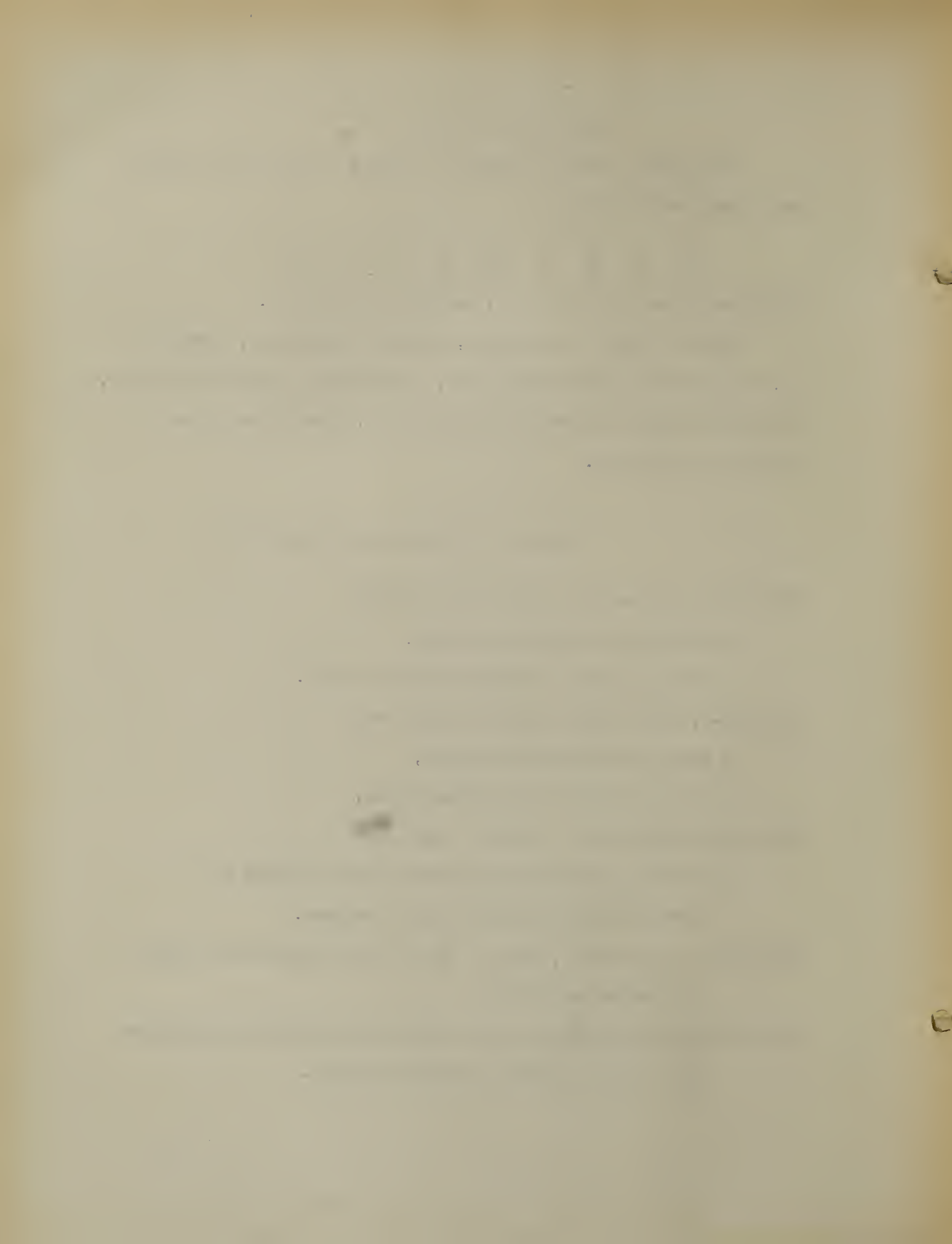
45 are used which have not been taught.

Table III, section VIII, page 36, shows that:

11 decade combinations beyond 39+9, and not needed for carrying in multiplication have been used.

Table IV-A, section VIII, page 37, shows the 23 primary facts used for proving subtraction.

Table V-A,B, section VIII, page 38, shows the 4 primary and 6 decade facts used in carrying in multiplication.



TEACHING GROUPS

* Group PVIII, Iroquois, Page 80

Numbers whose sums are 5 or 15

Primary or First Decade Facts

A

1 2 3 4 5 6 7 8 9	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1
2 3 4 5 6 7 8 9	2 2 2 2 2 2 2 2	2 2 2 2 2 2 2 2	2 2 2 2 2 2 2 2
3 4 5 6 7 8 9	3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3
4 5 6 7 8 9	4 4 4 4 4 4 4 4	4 4 4 4 4 4 4 4	4 4 4 4 4 4 4 4
5 6 7 8 9	5 5 5 5 5 5 5 5	5 5 5 5 5 5 5 5	5 5 5 5 5 5 5 5
6 7 8 9	6 6 6 6 6 6 6 6	6 6 6 6 6 6 6 6	6 6 6 6 6 6 6 6
7 8 9	7 7 7 7 7 7 7 7	7 7 7 7 7 7 7 7	7 7 7 7 7 7 7 7
8 9	8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8
9	9 9 9 9 9 9 9 9	9 9 9 9 9 9 9 9	9 9 9 9 9 9 9 9

B

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12									8	
13								7		
14						6				
15										
16										
17										
18										
19		1								
20										
21										
22									8	
23								7		
24						6				
25										
26										
27										
28										
29		1								
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.

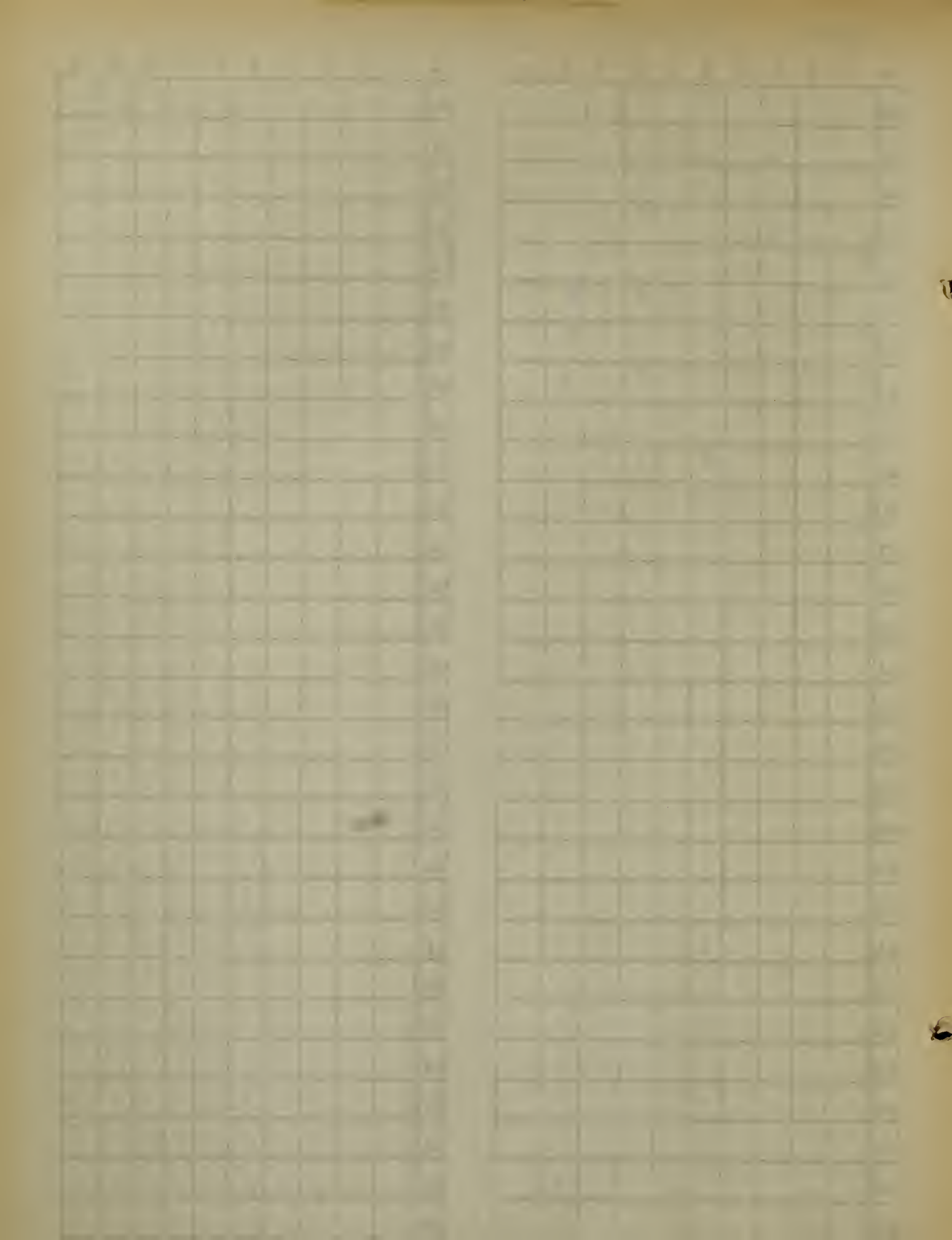
Continued from page 9

Table with 4 columns and 10 rows of data.

Table with 4 columns and 5 rows of data.



40							
42							
45							
48							
49							
54							
56							
63							
64							
72							
81							



Group VIII, Iroquois, Pages 80 - 91Color for Examples, Black

TABLE IV, Section VIII

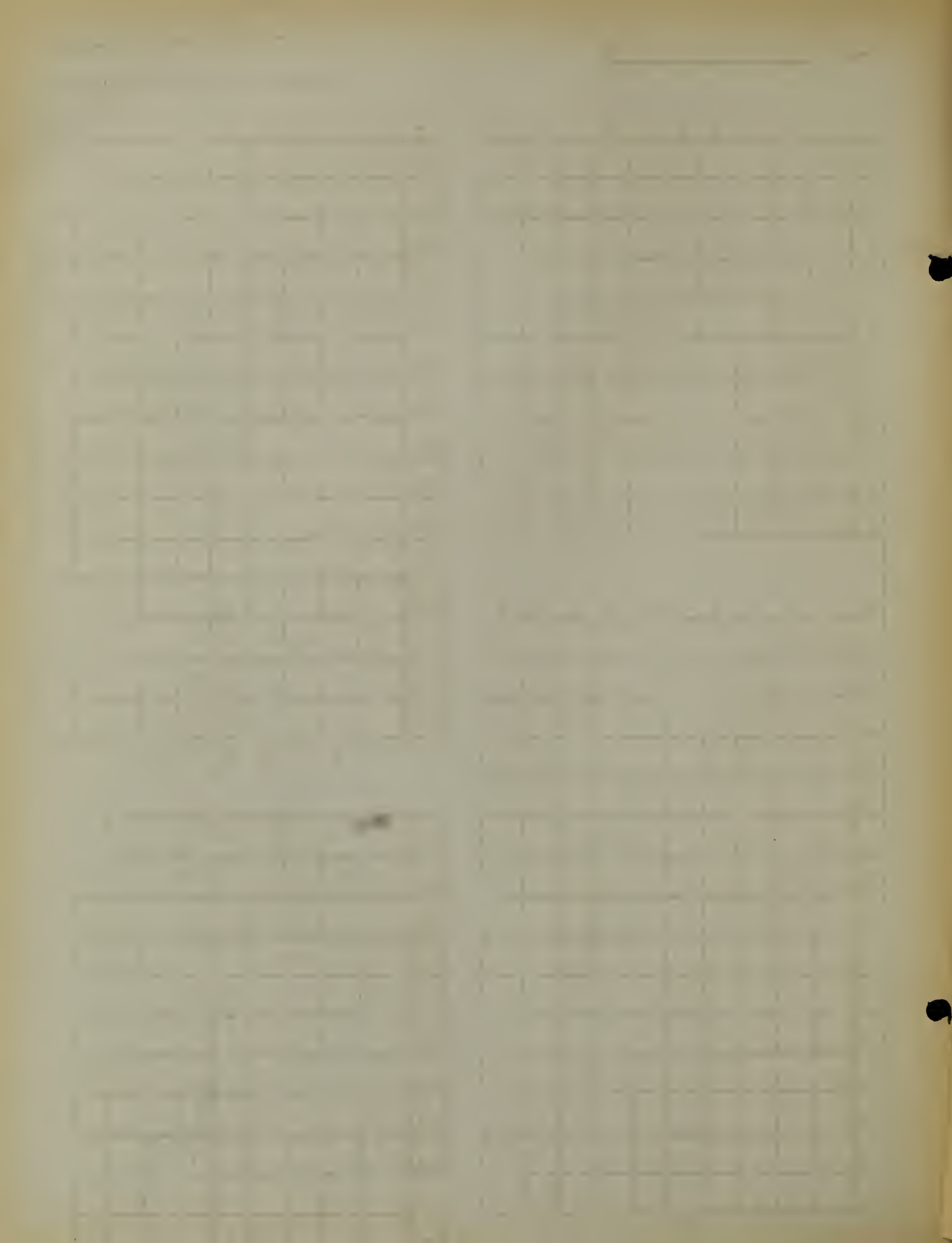
II Color for Problems, Red

	A									
+	0	1	2	3	4	5	6	7	8	9
0			1			2				
1	1	3	4	1	4				2	
2		1	1	6						
3			5					1		
4		3					1			
5	4									
6					1					2
7									3	
8								3		
9		1					2	2		

+	0	1	2	3	4	5	6	7	8	9
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
	0	1	2	3	4	5	6	7	8	9

	B								
+	0	1	2	3	4	5	6	7	8 , 9
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

[illegible]



Group IX and Drill

Group IX, Iroquois Arithmetic, page 92, includes the numbers whose sums are 4 or 14:

2	3	1	7	5	6	9	8	4
<u>2</u>	<u>1</u>	<u>3</u>	<u>7</u>	<u>9</u>	<u>8</u>	<u>5</u>	<u>6</u>	<u>0</u>

These combinations are shown in red, Table I, section IX, page 40.

The drill work of this group, Iroquois Arithmetic, pages 92 - 102, is tabulated in Table II-A, B, C, section IX, page 41, Table III, section IX, page 42, Table II, section IX, page 43, and Table II, section IX, page 44.

Results of Tabulations of Group IX

Table II- Section IX, page 41, shows that:

94 primary facts have been taught,

3 facts are used which have not been taught

1 fact reviewed is not used.

Table II-B, section IX, page 41, shows that:

8 decade facts have been taught,

22 decade facts are used which have not been taught.

Table II-C, section IX, page 41, shows that:

0 facts for carrying in multiplication have been taught.

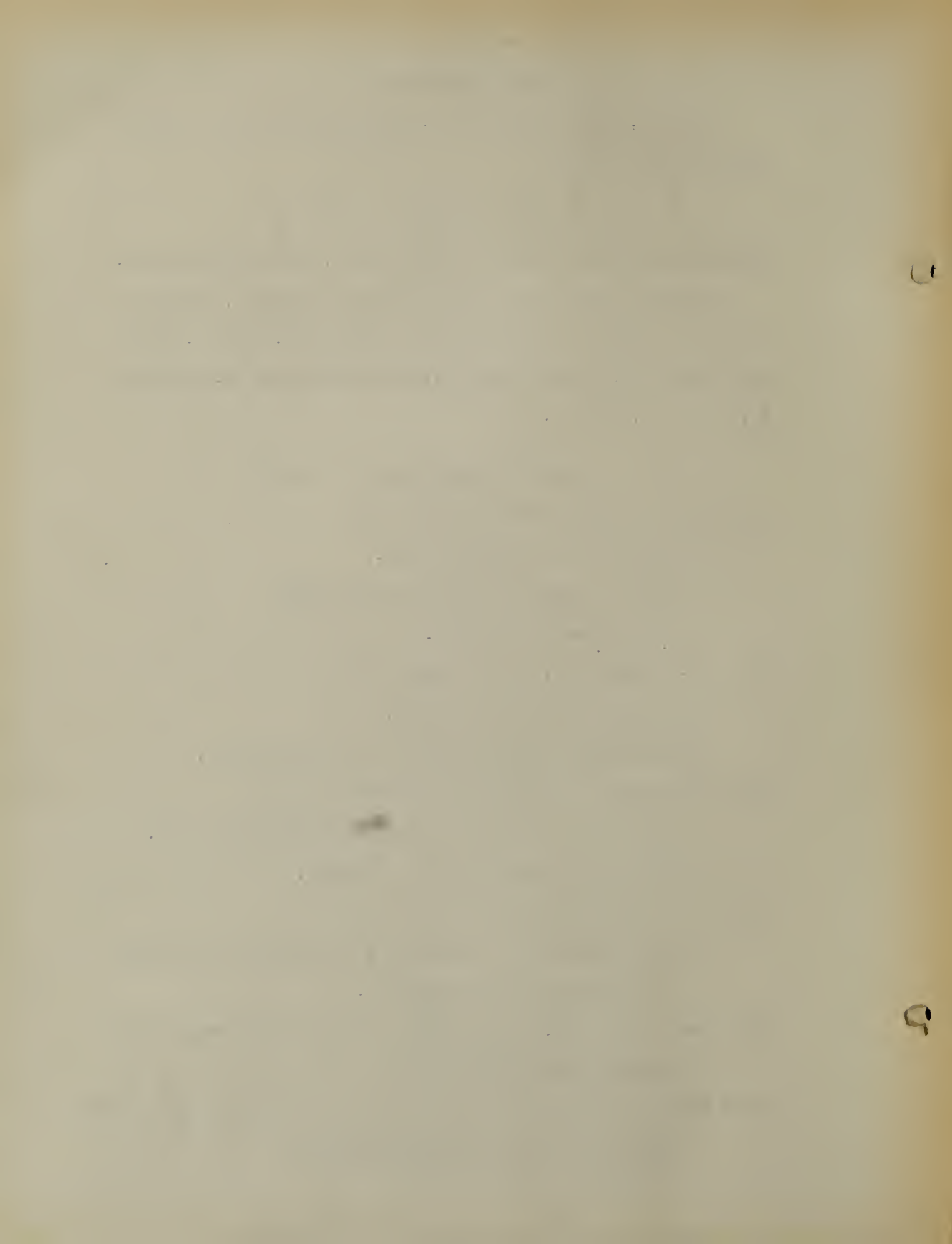
1 fact is used which has not been taught.

Table III, section IX, page 42, shows that:

8 decade combinations beyond 39+9, not needed for carrying in multiplication have been used.

Table II-A, section IX, page 43, shows the 24 primary combinations used in proving subtraction.

Table II-A, B, section IX, page 44, shows the 10 primary and 22 decade facts used in carrying in multiplication.



TEACHING GROUPS

* Group IX, Iroquois, Page 92

Numbers whose sums are 4 or 14

Primary or First Decade Facts

A

1 2 3 4 5 6 7 8 9	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9	2 3 4 5 6 7 8 9
2 3 4 5 6 7 8 9	2 2 2 2 2 2 2	3 4 5 6 7 8 9	3 4 5 6 7 8 9
3 4 5 6 7 8 9	3 3 3 3 3 3 3	4 5 6 7 8 9	4 5 6 7 8 9
4 5 6 7 8 9	4 4 4 4 4 4	5 6 7 8 9	5 6 7 8 9
5 6 7 8 9	5 5 5 5 5	6 7 8 9	6 7 8 9
6 7 8 9	6 6 6 6	7 8 9	7 8 9
7 8 9	7 7	8 9	8 9
8 9	8	9	9
9	9		

B

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12									8	
13								7		
14							6			
15										
16										
17										
18										
19		1								
20										
21										
22									8	
23								7		
24							6			
25										
26										
27										
28										
29		1								
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.

								C
40								
42								
45								
48								
49						1		
54								
56								
63								
64								
72								
81								



				c				
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

Group X and Drill

Group X, Iroquois Arithmetic, page 103, includes the numbers whose sums are 3 or 13;

2	1	3	4	6	5	9	7	8
<u>1</u>	<u>2</u>	<u>0</u>	<u>9</u>	<u>7</u>	<u>8</u>	<u>4</u>	<u>6</u>	<u>5</u>

These combinations are shown in red, Table I, section X, page 46.

The drill work of this group, Iroquois Arithmetic, pages 103 - 107, is tabulated in Table II-A, B, C, section X, page 47, Table III, section X, page 48, Table II, section X, page 49, and Table II, section X, page 50.

Results of Tabulations of Group X

Table II-A, section X, page 47 shows that:

94 primary facts have been taught,

4 facts are used which have not been taught.

Table II-B, section X, page 47 shows that:

8 decade facts have been taught,

49 decade facts are used which have not been taught.

Table II-C, section X, page 47, shows that:

0 facts for carrying in multiplication have been taught,

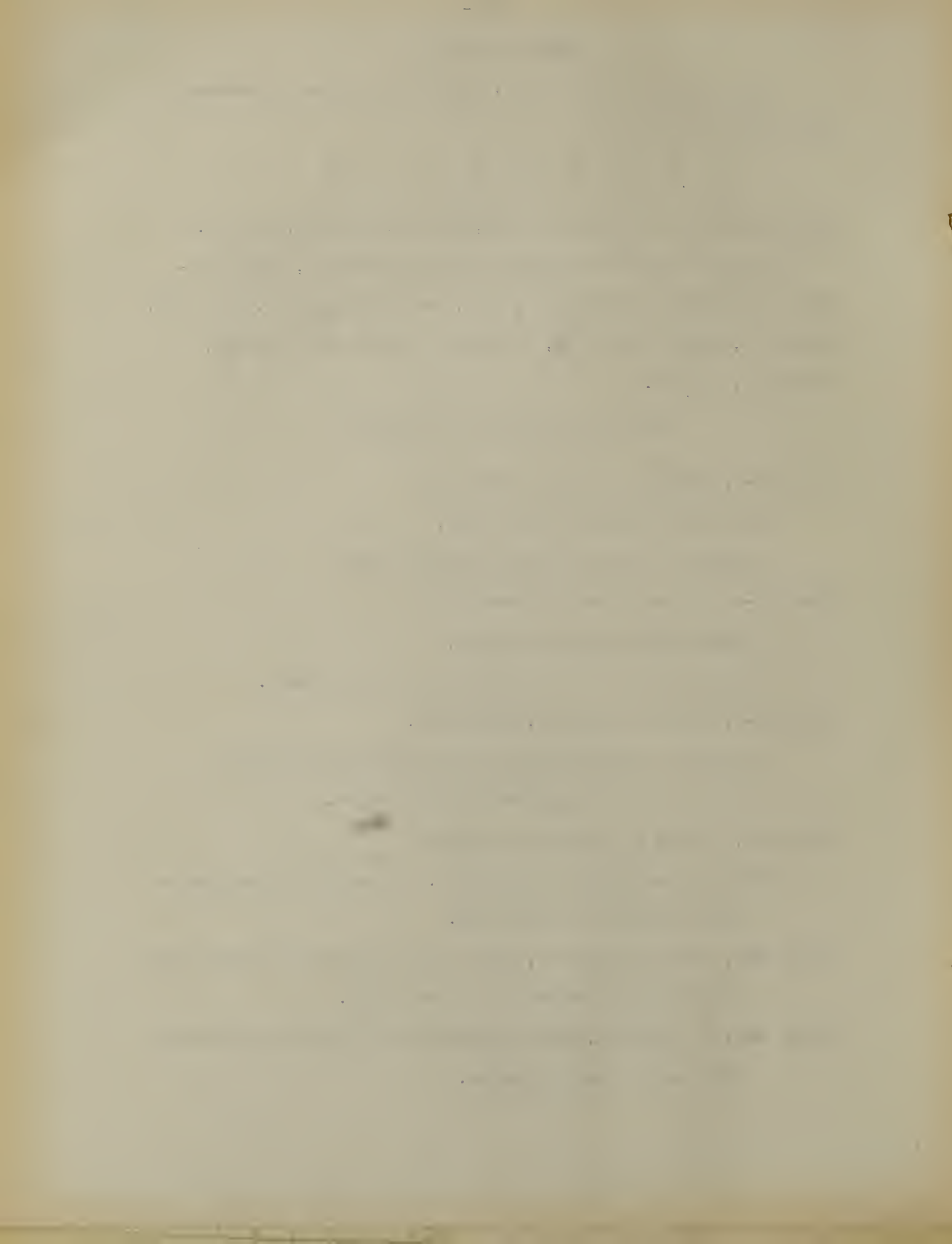
2 facts are used which have not been taught.

Table III, section X, page 48, shows that:

12 decade combinations beyond 39+9, not needed for carrying in multiplication have been used.

Table II-A, section X, page 49, shows the 25 primary combinations used in proving the subtraction in this drill.

Table II-A, B, section X, page 50, shows the 10 primary and 20 decade facts used in multiplication.



TEACHING GROUPS

* Group X, Iroquois, Page 103

Numbers whose sums are 3 or 13

Primary or First Decade Facts

A

1 2 3 4 5 6 7 8 9	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9
2 3 4 5 6 7 8 9	2 2 2 2 2 2 2 2 2	2 2 2 2 2 2 2 2 2	3 4 5 6 7 8 9
3 4 5 6 7 8 9	3 3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3 3	4 5 6 7 8 9
4 5 6 7 8 9	4 4 4 4 4 4 4 4 4	4 4 4 4 4 4 4 4 4	5 6 7 8 9
5 6 7 8 9	5 5 5 5 5 5 5 5 5	5 5 5 5 5 5 5 5 5	6 7 8 9
6 7 8 9	6 6 6 6 6 6 6 6 6	6 6 6 6 6 6 6 6 6	7 8 9
7 8 9	7 7 7 7 7 7 7 7 7	7 7 7 7 7 7 7 7 7	8 9
8 9	8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8	9
9	9 9 9 9 9 9 9 9 9	9 9 9 9 9 9 9 9 9	

B

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12									8	
13								7		
14							6			
15										
16										
17										
18										
19		1								
20										
21										
22									8	
23								7		
24							6			
25										
26										
27										
28										
29		1								
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.






















































































Facts Used in Drill Material for Group X
PART I

















































































































































Group X, Iroquois, Pages 103 - 107

TABLE II, Section X



































































Color for Examples, Black

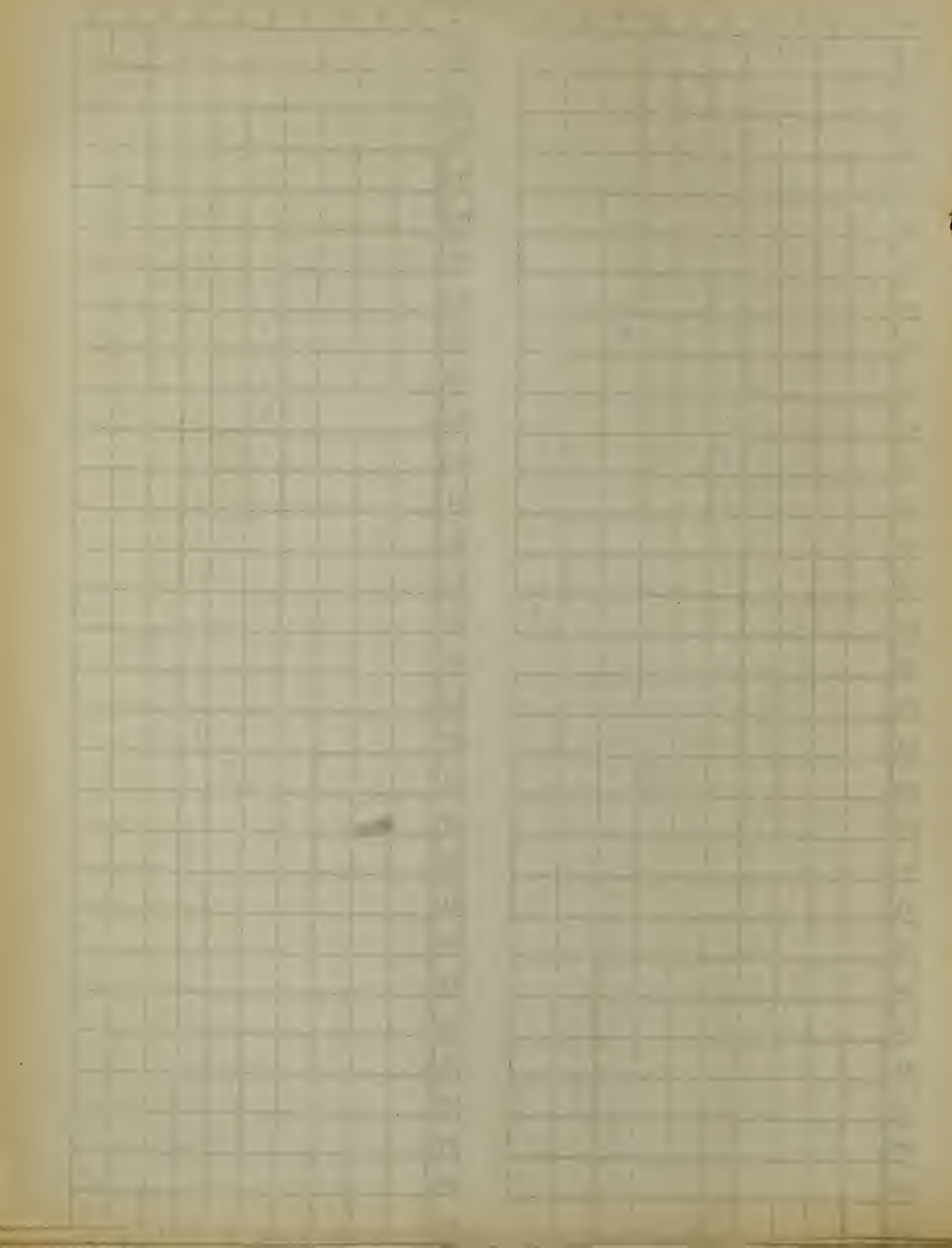
Color for Problems, Red

	A
+	0 1 2 3 4 5 6 7 8 9
0	 1  3  1   1  1 
1	 3  7  3  1   
2	1  7  4   1  1  3  2  2 
3	6  2   1  2  1  1  1 
4	 4  2  1      8 
5	1   1   1    1  5 
6	1     1    1  5 
7	1        10  
8	1  4  2  2  1  6    1 
9	     10    1 

	B
+	0 1 2 3 4 5 6 7 8 9
10	   1  1    2  1 
11	        
12	2  2  7   1  1    
13	2  2  7  4  5  2  3  3  
14	         3  1 
15	         5 
16	1  2    1      5 
17	         5 
18	         3  1 
19	         4 
20	2  1        
21	         1 
22	        
23	1  1  1  1      
24	2      1  1   

+	0	1	2	3	4	5	6	7	8	9
25									1	
26								2		
27			1				1			
28		1		1		2				
29			2		1					
30										
31										
32					1					
33										
34										1
35										
36				1		1				
37							1			
38						1				
39										
	0	1	2	3	4	5	6	7	8	9

	C
40	     
42	     
45	     
48	     
49	     
54	     
56	     
63	     
64	     
72	     
81	     



Addition Combinations Used in Proving Subtraction
PART II

Group X, Iroquois, Pages 103-107

TABLE II, Section X

Color for Examples, Black

Color for Problems, Red

	0	1	2	3	4	5	6	7	8	9
0				1						
1		1	3			1				
2		3								
3	2									
4		1								1
5			1						1	
6	1			1				1		
7							1			
8		1				1				
9					1					

B									
+	0	1	2	3	4	5	6	7	8, 9
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

[illegible]

40							
42							
45							
48							
49							
54							
56							
63							
64							
72							
81							



Group XI and Drill

Group XI, Iroquois Arithmetic, page 108, includes the numbers whose sums are 2 or 12:

1	2	7	9	8	5	3	4	6
<u>1</u>	<u>0</u>	<u>5</u>	<u>3</u>	<u>4</u>	<u>7</u>	<u>9</u>	<u>8</u>	<u>6</u>

These combinations are shown in red, Table 1, section XI, page 52.

The drill for this group, Iroquois Arithmetic, pages 108 - 120, is tabulated in Table II-A, B, C, section XI, page 53, Table III section XI, page 54, Table II-A, B, section XI, page 55, and Table II, section XI, page 56.

Results of Tabulations of Group XI

Table II-A, section XI, page 53, shows that:

94 primary facts have been taught,

1 fact is used which has not been taught

1 fact taught has not been used.

Table II-B, section XI, page 53, shows that:

8 decade facts have been taught,

75 decade facts are used which have not been taught.

Table II-C, section XI, page 53, shows that:

0 facts for carrying in multiplication have been taught.

2 facts are used which have not been taught.

Table III, section XI, page 54, shows that:

11 decade facts beyond 39+9, not needed for carrying in multiplication have been used.

Table II-A, B, section XI, page 55, shows the 39 primary and 1 decade combination used in proving subtraction.

Table II-A, B, section XI, page 56, shows the 7 primary and 36 decade combinations used in multiplication.



TEACHING GROUPS

* Group XI, Iroquois, Page 108

Numbers whose sums are 2 or 12

Primary or First Decade Facts

A

1 2 3 4 5 6 7 8 9	0 0 0 0	0 0 0 0
0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9	
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1	
1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9	
2 3 4 5 6 7 8 9	2 2 2 2 2 2 2	
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9	
3 4 5 6 7 8 9	3 3 3 3 3 3	
3 3 3 3 3 3 3	4 5 6 7 8 9	
4 5 6 7 8 9	4 4 4 4 4	
4 4 4 4 4 4	5 6 7 8 9	
5 6 7 8 9	5 5 5 5	
5 5 5 5 5	6 7 8 9	
6 7 8 9	6 6 6	
6 6 6 6	7 8 9	
7 8 9	7 7	
7 7 7	8 9	
8 9	8	
8 8	9	
9		
9		

B

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12									8	
13								7		
14							6			
15										
16										
17										
18										
19		1								
20										
21										
22									8	
23								7		
24							6			
25										
26										
27										
28										
29		1								
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

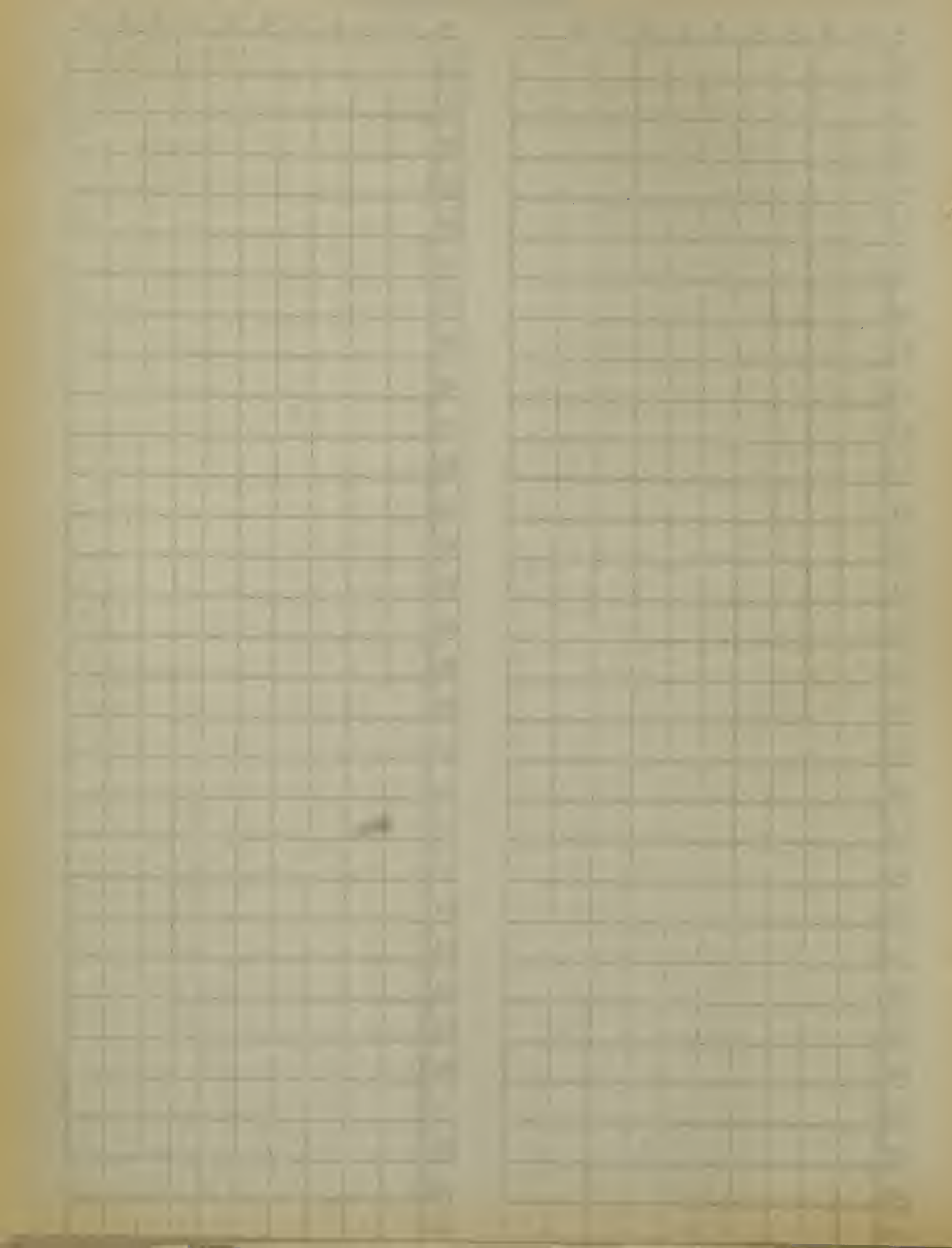
C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.

TABLE III, Section XI

[illegible]



Addition Combinations Used in Proving Subtraction PART II

Group XI, Iroquois, Pages 108 - 120,

TABLE II, Section XI

Color for Examples, Black

Color for Problems, Red

A

	0	1	2	3	4	5	6	7	8	9
0			4							
1	6	8	4	1	3	4	1	1		1
2	3	1					1		1	
3		1						3		4
4						1			2	1
5	1		1		1	1		1		
6			1		2	1	1		1	
7	1		1			2	1			1
8		1			1		1			
9				2						

B

[illegible]

+	0	1	2	3	4	5	6	7	8	9
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
	0	1	2	3	4	5	6	7	8	9

C

40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								



Addition Combinations Used in Multiplication PART III

Group XI, Iroquois, Pages 108 - 120

Color for Examples, Black

TABLE II, Section XI.

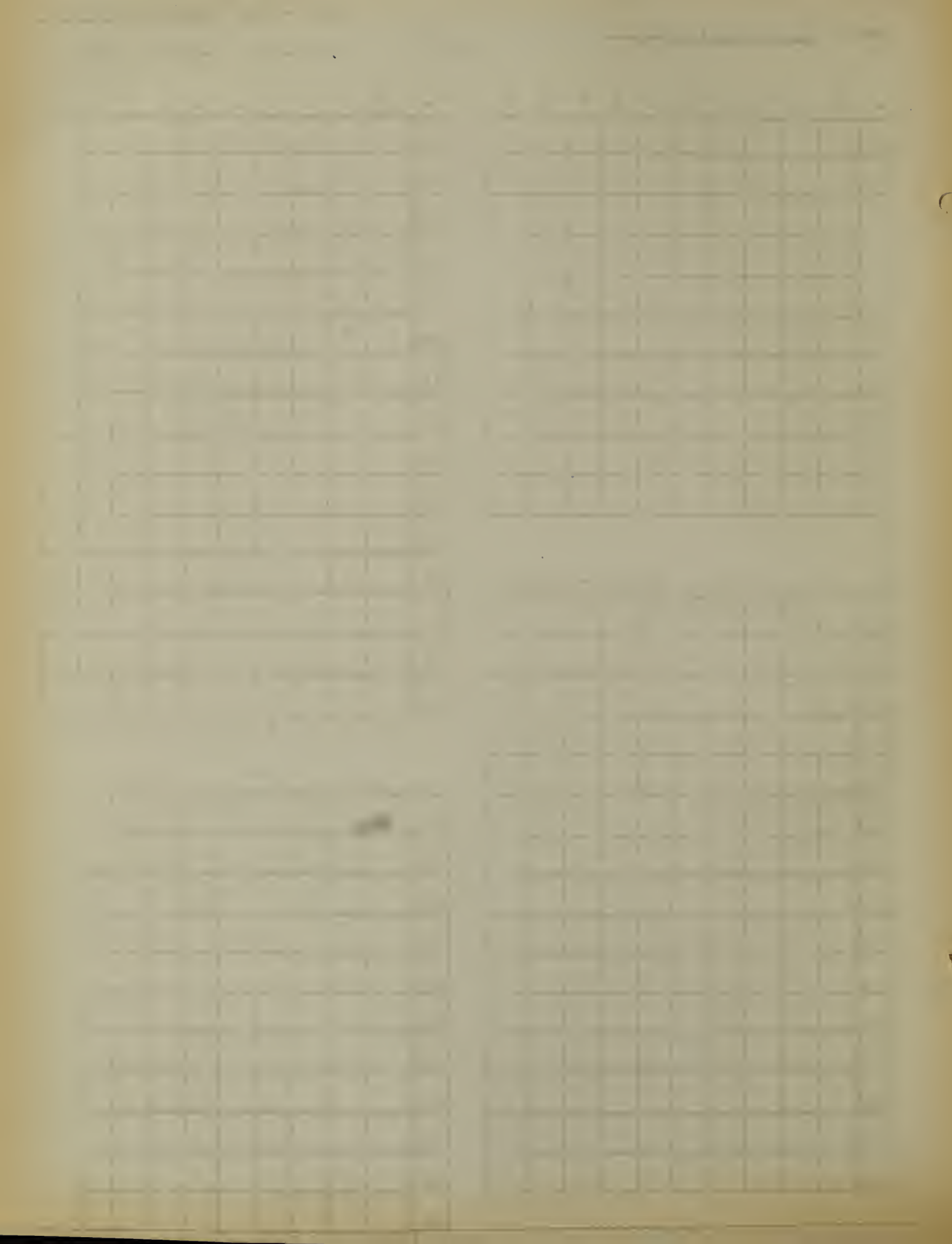
XI Color for Problems, Red

[illegible]

+	0	1	2	3	4	B ₅	6	7	8	9
10		2	1	2	2	1				
11										
12										
13										
14										
15		2	1	2	1				1	
16		1								
17										
18		1	1							
19										
20		1		2						
21					1					
22										
23										
24			1	1	1					

[illegible]

C					
40		2	1		
42					
45			1		
48					
49					
54					
56					
63					
64					
72					
81					



Group XII and Drill

Group XII, Iroquois Arithmetic, pages 121 - 128, includes the numbers whose sums are 1 or 11:

1	9	8	7	6	2	3	4	5
<u>0</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>9</u>	<u>8</u>	<u>7</u>	<u>6</u>

These combinations are shown in red, Table I, section XII, page 58.

The drill for this group, Iroquois Arithmetic, pages 121 - 128, is tabulated in Table II-A, B, C, section XII, page 59, Table III, section XII, page 60, Table II, A, B, section XII, page 61, and Table II-4, section XII, page 62.

Results of Tabulations of Group XII

Table II-A, section XII, page 59, shows that:

94 primary facts have been taught,

6 are used which have not been taught,

Table II-B, section XII, page 59, shows that:

8 decade facts have been taught,

79 are used which have not been taught.

Table II-C, section XII, page 59, shows that:

0 facts for carrying in multiplication have been taught,

1 fact is used.

Table III, section XII, page 60, shows that:

8 decade facts beyond $39+9$, not needed for carrying in multiplication have been used.

Table II-A, B, section XII, page 61, shows the 25 primary and 2 decade combinations used in proving subtraction.

Table II-A, section XII, page 62, shows the 3 primary combinations used in carrying in multiplication.

TEACHING GROUPS

* Group XII, Iroquois, Page 121

Numbers whose sums are 1 or 11

Primary or First Decade Facts

A

1 2 3 4 5 6 7 8 9	0 0 0 0	0 0 0 0
0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9	
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1	
1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9	
2 3 4 5 6 7 8 9	2 2 2 2 2 2 2	
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9	
3 4 5 6 7 8 9	3 3 3 3 3 3	
3 3 3 3 3 3 3	4 5 6 7 8 9	
4 5 6 7 8 9	4 4 4 4 4	
4 4 4 4 4 4	5 6 7 8 9	
5 6 7 8 9	5 5 5 5	
5 5 5 5 5	6 7 8 9	
6 7 8 9	6 6 6	
6 6 6 6	7 8 9	
7 8 9	7 7	
7 7 7	8 9	
8 9	8	
8 8	9	
9		
9		

B

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12									8	
13								7		
14						6				
15										
16										
17										
18										
19	1									
20										
21										
22									8	
23								7		
24						6				
25										
26										
27										
28										
29	1									
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

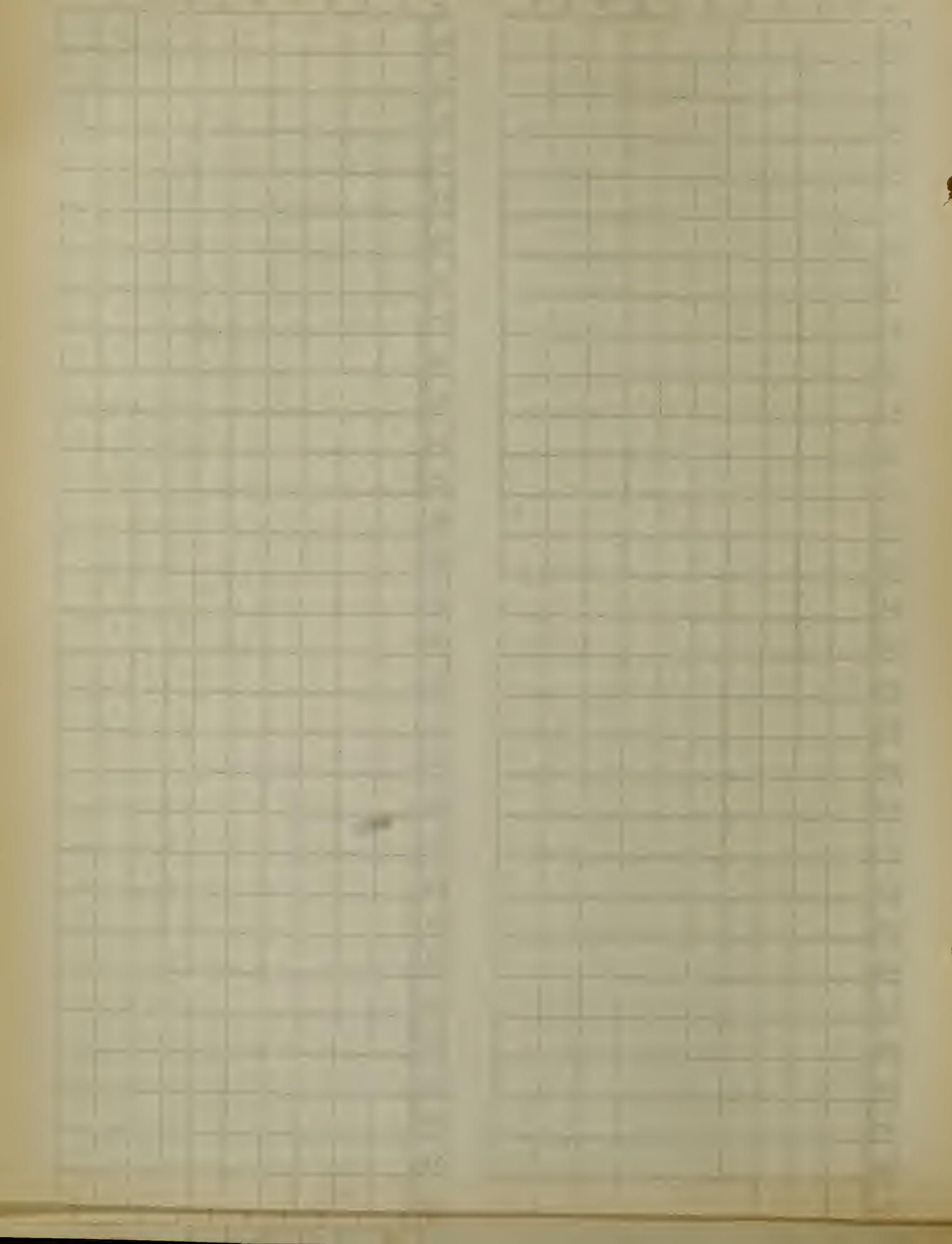
* New group in red,
Cumulative groups in black.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290
291	292	293	294	295	296	297	298	299	300

301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380
381	382	383	384	385	386	387	388	389	390
391	392	393	394	395	396	397	398	399	400



Color for Examples, Black

II Color for Problems, Red

+	0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---

+	0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---

25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
	0	1	2	3	4	5	6	7	8	9

4 0 1 2 3 4 5 6 7 8 9

	2	1							
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								



Addition Combinations Used in Multiplication

PART III

Group XII, Iroquois, Pages 121 - 128

Color for Examples, Black

TABLE II, Section XII Color for Problems, Red

Color for Problems, Red

[illegible]

	B								
+	0	1	2	3	4	5	6	7	8 , 9
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

+	0	1	2	3	4	5	6	7	8	9
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
	0	1	2	3	4	5	6	7	8	9

40							
42							
45							
48							
49							
54							
56							
63							
64							
72							
81							

Group XIII and Drill

Since the study of combinations was completed with Group XII, - Table I will be omitted in the remaining analysis.

The drill for this group, Iroquois Arithmetic, pages 129 - 137, is tabulated in Table II-A, B, C, section XIII, page 64, and Table II-A, B, C, section XIII, page 66.

Results of Tabulations of Group XIII

Table II-A, section XIII, page 64 shows that:

94 primary facts have been taught,

4 primary facts are used which have not been taught.

Table II-B, section XIII, page 64 shows that:

8 decade facts have been taught,

118 decade facts are used which have not been taught.

Table II-C, section XIII, page 64, shows that:

0 facts for carrying in multiplication have been taught.

2 facts are used.

Table II-A, B, C, section XIII, page 65, shows the 6 primary and 18

decade combinations used in carrying in multiplication.

Facts Used in Drill Material for Unit XIII
PART I

Group XIII. Iroquois. Pages 129 - 137

Color for Examples, Black

Color for Problems, Red

A

TABLE II, Section XIII

+	0	1	2	3	4	5	6	7	8	9
0		1		1		2				
1	1			1	1		1	2	1	3
2	1	1	3	3	1					1
3	1	1	1	1	1		2	1	1	
4		1	2	2		2	2			2
5	1	2	2	2	1	1	2	1		
6	2	1		1	2	1	1	1		1
7	2		1	1	1	1	2	2	1	
8			1	1	1	2		1		
9	2	4			2	1	2	2	3	

B

	0	1	2	3	4	5	6	7	8	9
10	1	3	3	1	2	1	2	1	2	1
11		1	1	1	2				2	
12				2	1		2	2	1	
13	1		1	2	3	1		2	1	2
14	1			1	2				1	1
15	1	1	1	2	1		1		2	1
16			1	2		1		1	1	2
17	1	1		1	1		2	1	1	2
18	1	1	1	2	1		1		1	1
19		1	1	3	1	1				1
20			1	1			1	1		
21		1			1	2	1	1	1	
22	2	1				2			1	
23				1		1	6		1	
24					2		1		1	1

+	0	1	2	3	4	5	6	7	8	9
25							1	1	2	
26	1	1							1	
27			1			1			1	1
28						1	2	1		2
29					1		2			1
30						1				1
31										1
32			1					1		
33								3		
34	1	1						1		1
35								2		1
36									1	
37						1				
38										
39						1				
	0	1	2	3	4	5	6	7	8	9

C

40	1	1
42		
45		
48		
49		
54		
56		
63		
64		
72		
81		

Addition Combinations Used in Multiplication PART II

Group XIII, Iroquois, Pages 129 - 137

Color for Examples, Black

Color for Problems, Red_____

A TABLE II, Section XIII

[illegible]

B

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12			2			1				
13										
14										
15										
16										
17										
18		1	1	4	1					
19										
20										
21										
22										
23										
24				2	3	1				

+	0	1	2	3	4	5	6	7	8	9
25										
26										
27										
28										
29										
30		1								
31										
32										
33										
34										
35										
36		1		1						
37										
38										
39										
	0	1	2	3	4	5	6	7	8	9

C

40							
42				1	1		
45							
48		2		1		3	
49							
54					1		
56							
63							
64							
72							
81							

Group XIV and Drill

The drill for this group, Iroquois Arithmetic, pages 138-144, is tabulated in Table II - A, B, section XIV, page 67, and Table II-B, C, section XIV, page 68.

Results of Tabulations of Group XIV

Table II-A, section XIV, page 67, shows that:

94 primary facts have been taught.

5 primary facts are used which have not been taught.

Table II-B, section XIV, page 67, shows that:

8 decade facts have been taught,

106 are used which have not been taught.

Table II-B, C, section XIV, page 68 shows the 11 decade combinations used in carrying in multiplication.

PART I

Group XIV, Iroquois, Pages 138 - 144

Color for Examples, Black

Color for Problems, Red

A

TABLE II, Section XIV

	0	1	2	3	4	5	6	7	8	9
0			1	1		1		1		
1	8	10	14	7	12	6	8	8	5	4
2	3	4	5	4	6	8	5	8	7	7
3	5	2	1	3	6	4	9	4	4	2
4	1	3	2	2	2	2	2	5	1	
5	5	1	5	2	3	3	3	1	6	2
6	2	1	4	3	2	4	5	3	3	2
7	4	3	4	3	4		4	3	4	8
8	1	4	3	2	1	6	5	5	4	2
9	4	4	5	2	6	6	4	4	2	2

B

[illegible]

+	0	1	2	3	4	5	6	7	8	9
25							1	2		1
26				1	2			2	2	
27							2			
28								1		
29						1	1			
30										
31	1									
32										1
33								1	1	
34						1				
35										
36										
37										
38										
39					1					
	0	1	2	3	4	5	6	7	8	9

C

40							
42							
45							
48							
49							
54							
56							
63							
64							
72							
81							

Group XV and Drill

The drill for this unit, Iroquois Arithmetic, pages 145 - 156, is tabulated in Table II-A, B, section XV, page 70, and Table II-A, B, C, section XV, page 71.

Results of Tabulations of Group XV

Table II-A, section XV, page 70, shows that:

94 primary facts have been taught,

6 are used which have not been taught.

Table II-B, section XV, page 70, shows that:

8 decade facts have been taught,

142 are used which have not been taught.

Table II-A, section XV, page 71, shows the 3 primary combinations used for carrying in multiplication; Table II-B, the 14 decade combinations used whose sums are less than $39 + 9$; and Table II-C, the 5 decade combinations used whose sums are more than $39 + 9$.

Color for Problems, Red

40							
42							
45							
48							
49							
54							
56							
63							
64							
72							
81							

Addition Combinations Used in Multiplication PART II

Group XV, Iroquois, Pages 145 - 156

Color for Examples, Black

Color for Problems, Red

TABLE II, Section XV

[illegible][illegible][illegible]

40							
42			1			1	
45							
48							
49			2	1			
54							
56					1		
63							
64							
72							
81							

Group XVI and Drill

The drill for this group, Iroquois Arithmetic, pages 157 - 186, is tabulated in Table II-A, B, section XVI, page 73, Table III, Section XVI, page 74, and Table II-A, B, C, section XVI, page 74.

Results of Tabulations of Group XVI

Table II-A, section XVI, page 73, shows that:

- 94 primary facts have been taught,
- 2 are used which have not been taught.

Table II-B, section XVI, page 73, shows that:

- 8 decade facts have been taught,
- 85 have been used which have not been taught.

Table III, section XVI, page 74, shows that:

- 2 decade facts beyond $39 + 9$, not needed for carrying in multiplication have been used.

Table II-A, section XVI, page 76, shows the 77 primary combinations used for carrying and totaling partial products in multiplication; Table II-B, the 79 decade combinations used whose sums are less than $39 + 9$; and Table II-C, the decade combinations used whose sums are more than $39 + 9$.

Page 75 shows the method of obtaining the addition combinations used in multiplication examples which have more than a one place multiplier. The examples used are on page 180 of the Iroquois Arithmetic. The combinations are a part of those tabulated in Table II, page 76.

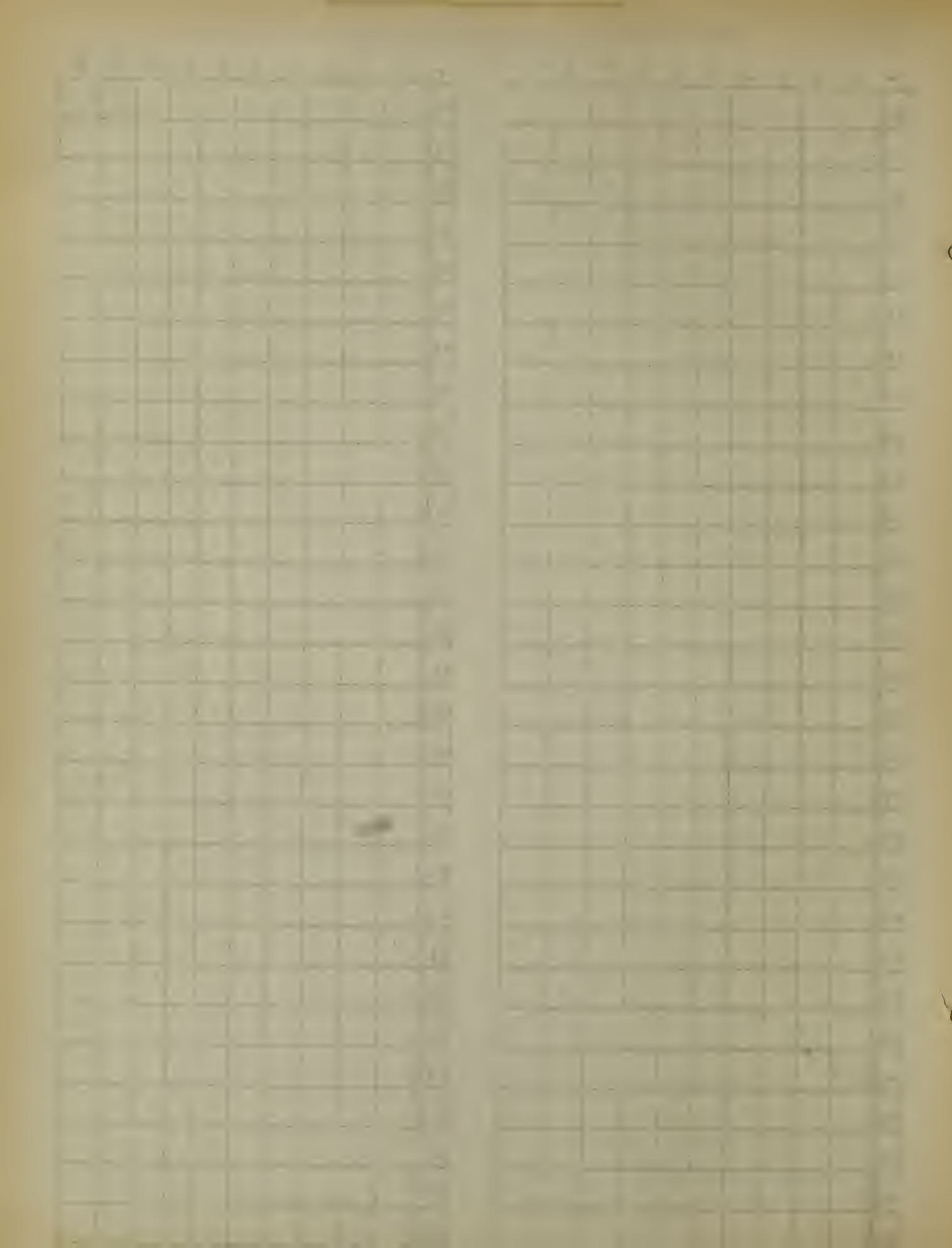
Color for Examples, Black

Color for Problems, Red

TABLE II, Section XVI

[illegible]





Method of Obtaining the Addition Combinations Used in Multiplication

Examples on Page 180 of the Iroquois Arithmetic

1.

460
27
3220
920

*28+4
8+1
#0+2
2+2
9+3

2.

817
34
3268
2451

4+2
3+2
1+6
5+2
4+3

3.

910
45
4550
3640

0+5
4+5
6+4
1+3

4.

997
61
997
5982

54+4
54+5
2+9
1+8
9+9
1+9

5.

1516
18
12128
1516

8+4
40+1
8+4
6+2
1+1
5+2
1+1

6.

1408
38
11264
4224

0+6
8+3 0+2
3+1
4+6
1+2
3+2
2+1
4+1

7.

2275
46
13650
9100

42+3
12+4
12+1
28+2
8+3
8+1
0+5
0+6
1+3
9+1

8.

3777
93
11331
33993

21+2
21+2
9+2
63+6
63+6
27+6
3+3
9+3
1+9
10+1
1+3
4+1

9.

701
99
6309
6309

9+0
0+3
3+6

10.

8711
87
60977
69688

56+4
64+5
8+7
1+8
9+9
1+7
7+0
9+6

11.

6025
53
18075
30125

6+1
10+2
0+1
5+7
1+2
3+0
1+8
0+3

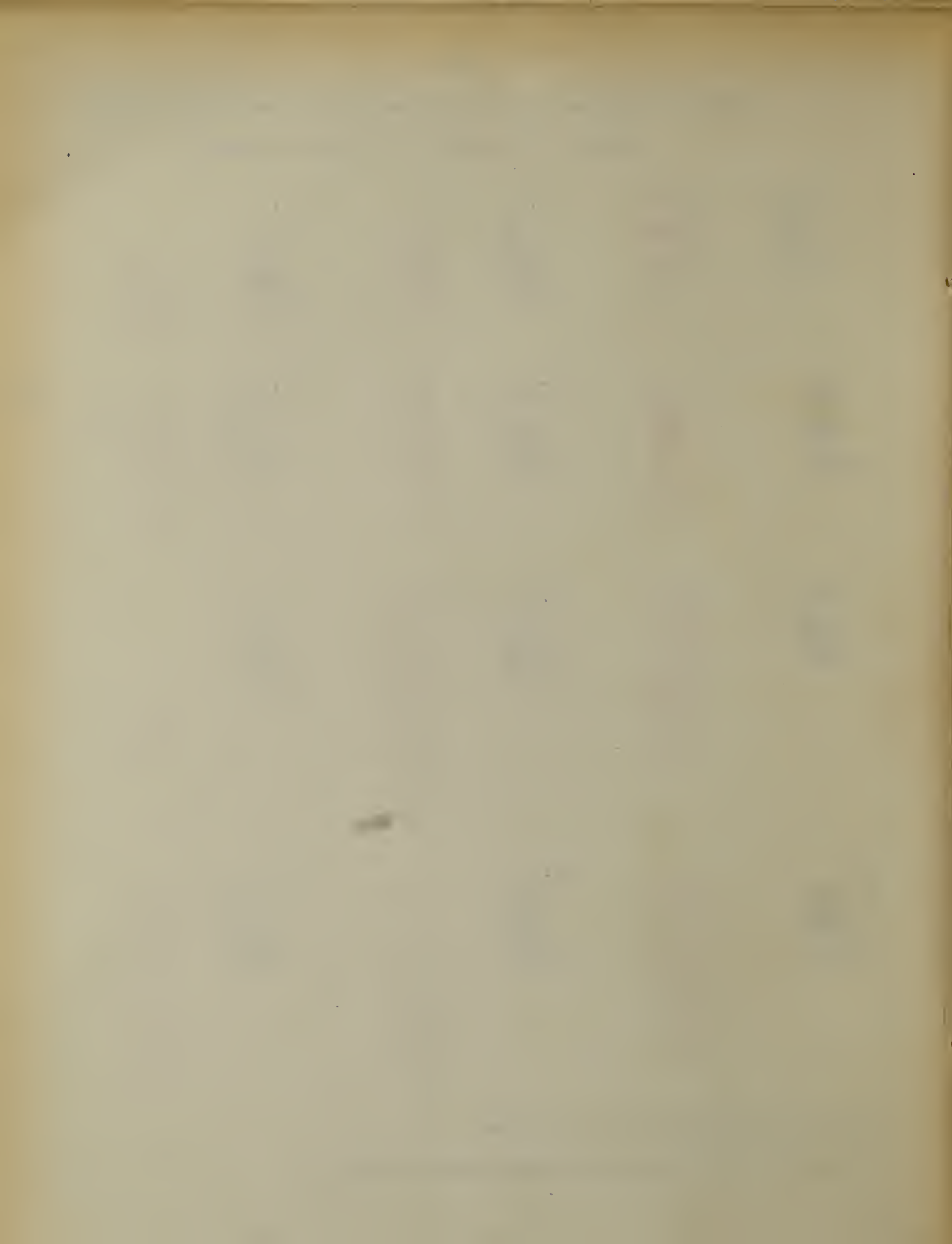
12.

9505
76
57030
66535

0+3
54+3
0+3
63+3
5+3
3+0
5+7
1+6
7+5
1+6

* Addition combinations used in carrying.

Addition combinations used in adding partial products.



Addition Combinations Used in Multiplication
PART II

Group XVI, Iroquois, Pages 157 - 186

Color for Examples, Black

Color for Problems, Red

TABLE II, Section XVI

A										
+	0	1	2	3	4	5	6	7	8	9
0	1	8	10	9	5	4	8	1	2	2
1	3	11	7	12	14	7	14	9	7	4
2	3	8	4	3	1	1	2		1	2
3	3	6	6	2	2	3	1	1		1
4		3	7	5	5	3	3	1		1
5	1	3	7	3	2		1	6		3
6	2	6	9	7	4		1	1		1
7	1	4	1	3	2	1	2	1	1	1
8	4	5	7	10	7	2	6	2	1	2
9	2	5	6	2	2		3	3	2	2

B										
+	0	1	2	3	4	5	6	7	8	9
10		6	2	1	1				1	
11					1					
12		10			4					
13							1		1	
14		3	2		1				1	
15		3		1	1				1	
16			3	1	1	2	3	1		
17										
18		1	4	1	2	2	2	1	1	
19										
20		1	1	2	1					
21			3			1				
22										
23										
24		4	5	2		1	1			

+	0	1	2	3	4	5	6	7	8	9
25			1							
26										
27		1	2				1	2		
28		2	1	4	1	3				
29			1	1						
30			1	1						
31										
32		1	1	2	1	1	1	1		
33										
34										
35			1	1	1	1	1			
36		1	2	3	1		1	1		
37										
38										
39										

C										
+	0	1	2	3	4	5	6	7	8	9
40		1		3	1		1			
42			1	2	1	2	1			
45		1	1	1			1	1	1	
48			1		3	1	1	1		
49		1			1		1			
54				1	2	1	2		1	
56		2	1	3	2	1	3			
63			2	3	1		2		1	
64			2		1	2				
72		1	2		1	3				
81		1					2			



SUMMARY

Table A:

94 primary facts have been taught,

100 primary facts have been used.

The drill work in the primary facts is quite evenly distributed although four of the difficult facts have had the least drill. These four are as follows: $0+0$, $0+7$, $0+8$, $0+9$.

Table B:

8 decade facts taught, up to $39+9$,

276 decade facts used up to $39+9$.

Table C:

0 facts necessary for carrying in multiplication are taught.

60 facts necessary for carrying in multiplication are used,

The facts used in drill as shown in this table are beyond social and business usage and therefore should not have occurred in the drill service.

Table D:

0 combinations beyond social and business usage are taught,

92 combinations beyond social and business usage are used,

The combinations used in this table are beyond business and social usage and therefore should not be used in the drill service.

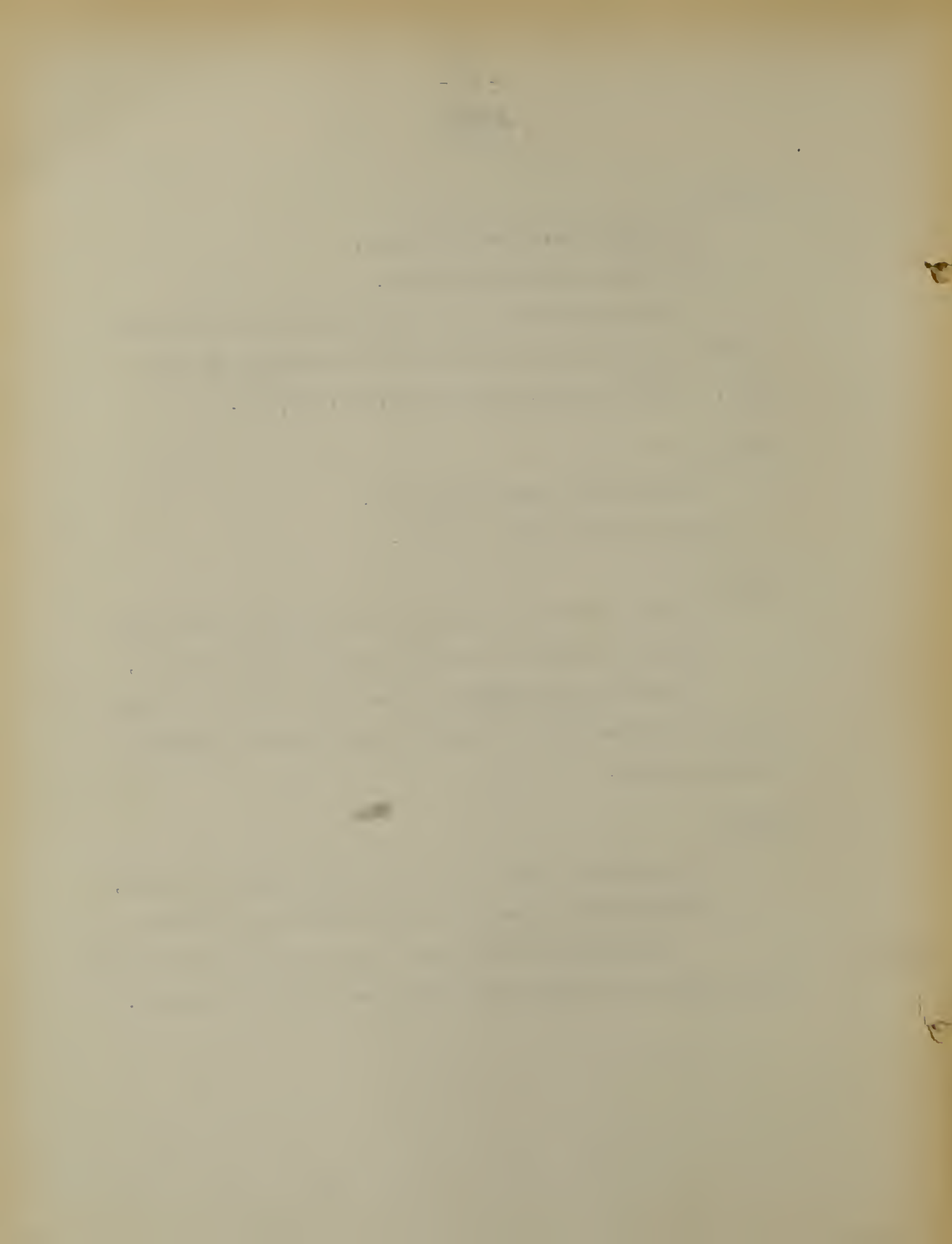


TABLE I Iroquois
SUMMARY

TEACHING GROUPS

* Group Iroquois

Primary or First Decade Facts

A

1 2 3 4 5 6 7 8 9	0 0 0 0
0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9
2 3 4 5 6 7 8 9	2 2 2 2 2 2 2
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9
3 4 5 6 7 8 9	3 3 3 3 3 3
3 3 3 3 3 3 3	4 5 6 7 8 9
4 5 6 7 8 9	4 4 4 4 4
4 4 4 4 4 4	5 6 7 8 9
5 6 7 8 9	5 5 5 5
5 5 5 5 5	6 7 8 9
6 7 8 9	6 6 6
6 6 6 6	7 8 9
7 8 9	7 7
7 7 7	8 9
8 9	8
8 8	9
9	
9	

B

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12									8	
13								7		
14							6			
15										
16										
17										
18										
19		1								
20										
21										
22									8	
23								7		
24							6			
25										
26										
27										
28										
29		1								
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.

TABLE II Iroquois
SUMMARY

Group Iroquois

Color for Examples, Black

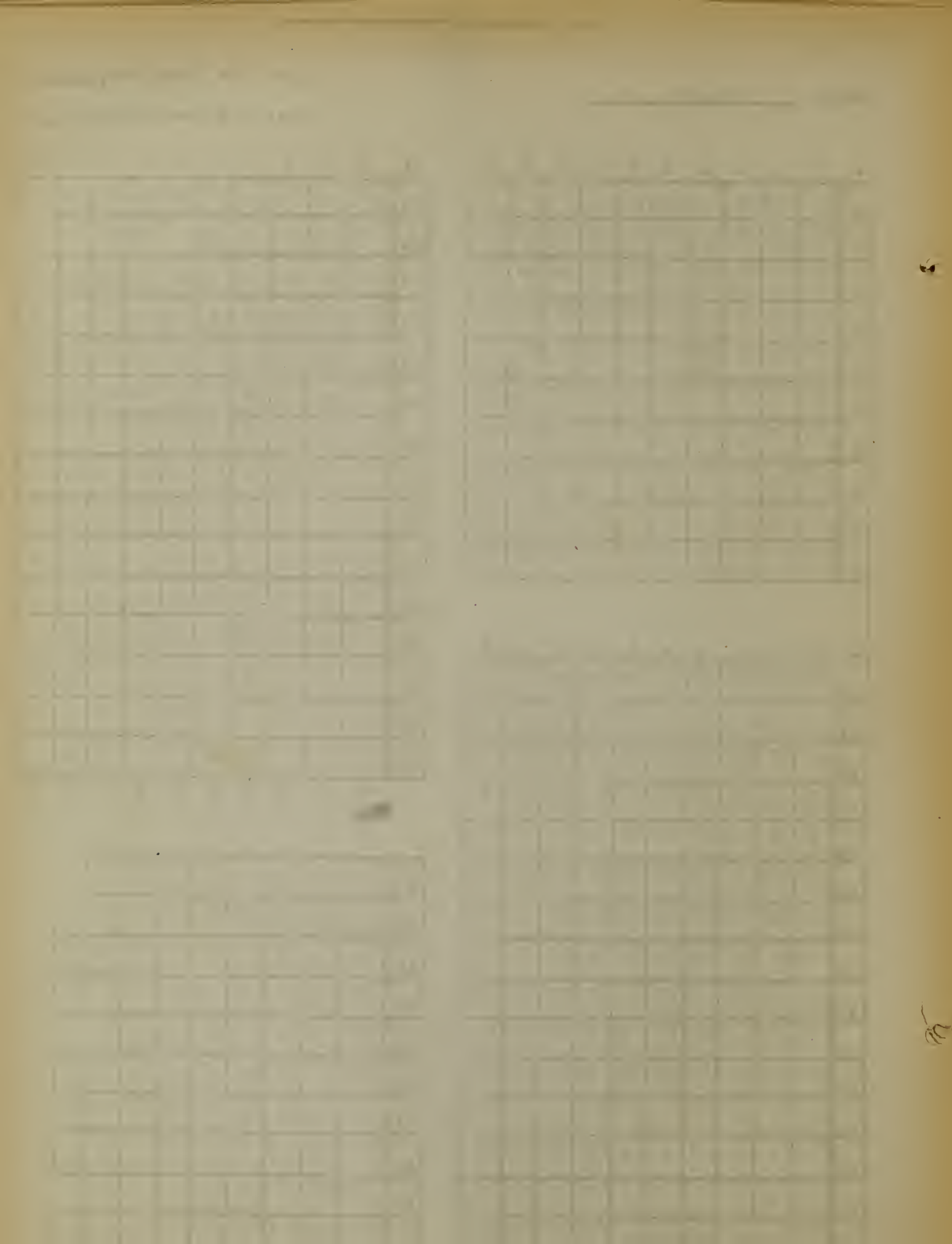
Color for Problems, Red

A										
+	0	1	2	3	4	5	6	7	8	9
0	8	18	20	26	13	14	16	7	6	7
1	30	97	77	57	56	41	44	44	44	40
2	16	46	61	40	39	25	25	36	48	27
3	22	35	37	41	25	23	48	47	11	19
4	16	35	33	25	44	35	43	19	14	17
5	23	17	34	25	26	55	23	17	18	20
6	23	34	32	32	40	24	52	19	20	16
7	19	22	30	32	17	18	26	42	24	23
8	16	53	55	32	23	23	29	19	50	23
9	27	49	20	21	27	24	29	37	25	60

+	0	1	2	3	4	5	6	7	8	9
25	2	1	4	4	7	13	5	5	3	3
26	1	2	4	4	30	1	17	8	7	3
27	2	4	8	9	4	4	5	12	6	5
28		9	24	9	6	8	5	6	7	6
29		10			3	2	5	4	4	10
30		8	6	7	7	9	19	12	7	6
31	1	1	1	2	2	1	3	1	3	2
32		1	8	5	6	2	2	2	8	2
33				1	1	1	2	6	1	3
34	2	2	2		7	6	2	2	3	2
35	1	2	3	2	4	8	1	3		1
36		4	5	12	9	4	3	2	1	
37		1	1	5	1	1	1	2	1	3
38			2			2	2	3		
39				1	1	3		1	1	7

B										
+	0	1	2	3	4	5	6	7	8	9
10	11	37	28	25	25	39	28	30	31	32
11	5	8	11	8	17	10	11	16	8	20
12	6	27	22	20	24	12	9	9	35	6
13	9	6	11	15	12	5	8	21	13	7
14	3	11	8	8	31	9	26	8	8	10
15	5	15	8	13	18	30	9	11	13	9
16	5	14	17	17	41	13	33	13	6	11
17	7	8	4	22	11	8	14	14	7	9
18	4	14	51	15	12	6	14	12	35	8
19	3	13	6	8	8	8	7	9	6	23
20	3	22	19	18	21	25	29	21	22	26
21	5	4	4	7	5	7	8	2	3	13
22	3	4	6	3	2	4	2	5	19	2
23	2	2	2	7	3	3	7	8	4	3
24	2	11	11	8	15	9	12	2	4	5

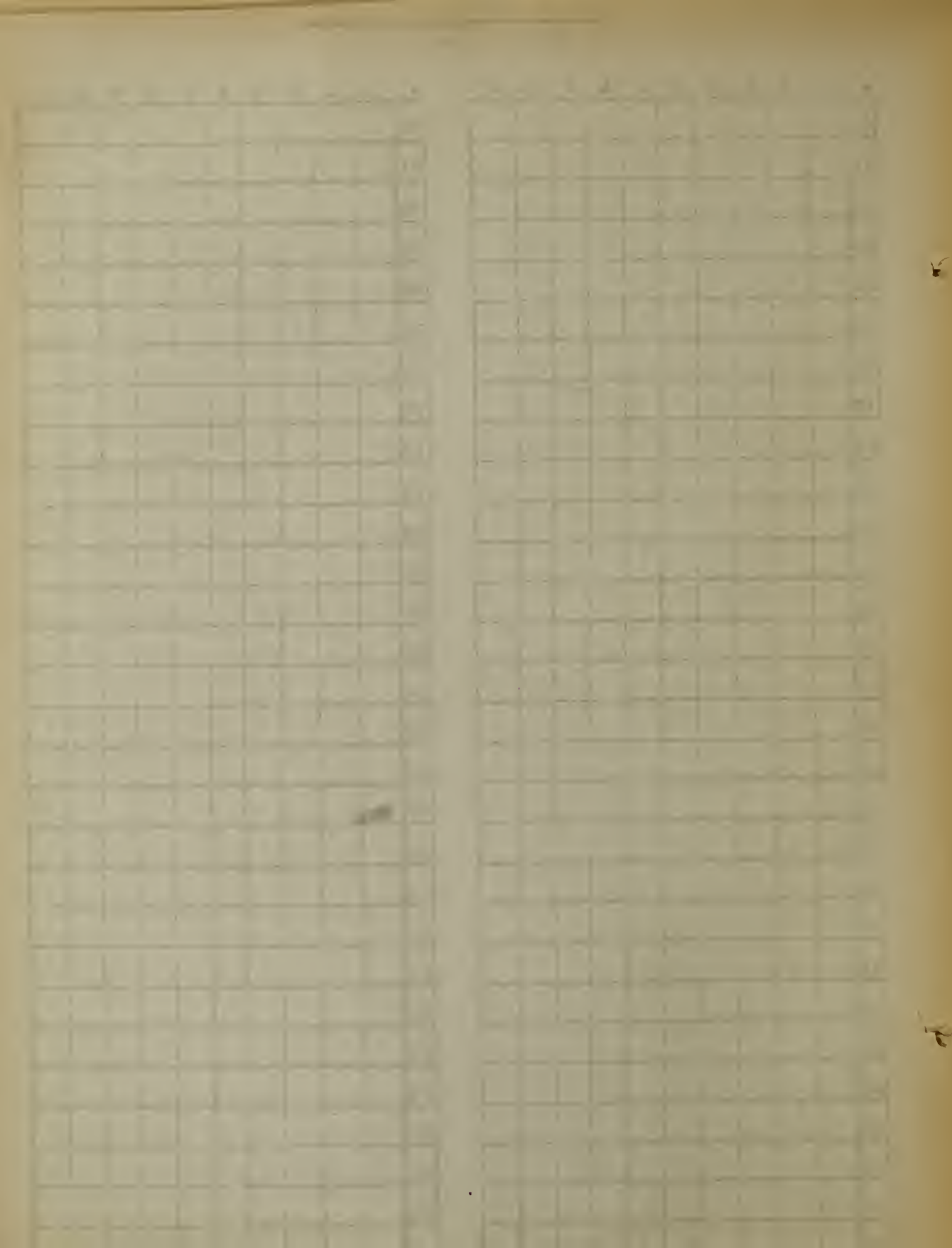
C										
40	3	4	6	5	2	2	3			
42		2	5	3	4	2				
45	1	3	1	2		1	2	2		
48	2	1	1	4	4	1	1			
49	1	2	2	2	1	1				
54			2	4	1	2	1	1		
56	2	1	3	3	1	4				
63		2	4	1		2		1		
64		2	1	1	2					
72	1	2		2	3					
81	1				1	2				



Iroquois Summary Table

↑	0	1	2	3	4	5	6	7	8	9 ^D
40										
41										
42										2
43			1	2					1	
44		1			1				1	
45										1
46									1	1
47				1				2	2	1
48									2	1
49								1		2
50										
51						1				
52			1	2	1					1
53					1					1
54										1
55										
56									1	1
57							1			
58						1	1		1	
59									1	1
60						1				
61				1	1					
62										
63										
64									1	
65		1						1	2	
66								1		
67						1		1	1	1
68					1	1				1
69					1	1		1		1

[illegible]



PART TWO

THE FOLLOWING ANALYSIS COVERS THE ADDITION
DRILL IN
100% ACCURACY IN THE FUNDAMENTALS OF ARITHMETIC
ADDITION

by

GUY M. WILSON

Preliminary and Experimental Edition

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1928

Analysis of the Addition in 100% Accuracy in the Fundamentals of
Arithmetic

Purpose

This analysis is for the purpose of finding out the following:

1. The teaching groups.
2. The number of combinations taught and their frequency.
3. Whether the facts taught precede their occurrence in examples.
4. The process steps taught.
5. Whether the process steps taught precede their occurrence in examples.

Explanation of Method

Three different tables are used for each teaching group.

Table IV shows the teaching groups.

Table V shows:

1. The frequency of these combinations in drill examples and problems for this group.
2. The combinations, if any, that have preceded the group teaching.
3. The combinations, if any, that have been studied and have not been included in drill work.

In this table the combinations are tabulated in three groups:

- A. The 100 primary combinations
- B. The 300 decade combinations to $39 + 9$
- C. The 80 combinations needed for carrying in multiplication.

Table VI shows the combinations, if any, beyond the limits of those needed for social and business usage, namely, those from $40 + 1$ to $99 + 9$ with the exception of those needed for carrying in multiplication, which have already been recorded in Table II.

Pages 2 to 5 inclusive contains the authors detailed introduction to the work in the book. This introduction is commented upon on page 84 of this analysis.

In Table I the teaching combinations are in red and read from the bottom up. The combinations used are recorded in Table V, the primary group "A" which are read from left to top as; $\begin{matrix} & 0 & 1 & 2 \\ 0 & 0 & 0 \end{matrix}$; the decade in group "B" which are read from left to top as: $\begin{matrix} & 0 & 1 & 2 \\ 11 & 12 & 13 \end{matrix}$. The number in each square indicates the frequency of use of the combinations represented by the square. The black figures indicate combinations used in examples and the red figures the combinations used in problems.

There are no problems in this book so there will be no red figures.

In the introduction of the book the author goes into great detail and explains quite clearly the purpose of the book and his new ideas in the teaching of arithmetic.

He first tells of the development of the book and its successful tryout in a large city. He then goes on to explain the step by step teaching process that should be followed with emphasis upon one hundred percent accuracy rather than on material.

He next explains the facts in addition. He claims there are one hundred primary facts, three hundred decade facts up to $39 + 9$, and eighty additional decade facts needed in carrying in multiplication. At this point the author should have suggested that the reader should read, "What Arithmetic Shall We Teach", by Guy M. Wilson. This would have thrown more light on how he arrived at his conclusion as to the number of facts or combinations that should be taught. He might have added further clearness at this point if he had explained what he meant by facts or combinations.

The next step in the explanation brought out the importance of the process steps as part of the teaching program. The author then listed his seven steps, and briefly stated the importance of creating and sustaining pupil interest in teaching. At this point the author should have suggested that the reader might get a better understanding of motivation if he would read, "Motivation of School Work" by Wilson and Wilson.

The introduction was brought to a close by the discussion of systematic drill, systematic procedure, an explanation of the grouping of the facts for teaching, and the author's idea of a good fact drill service.



Group I

Group I, page 10 in the text, includes the following primary combinations:

3	4	3	2	6	4	9	5	2	1
<u>2</u>	<u>5</u>	<u>9</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>3</u>	<u>4</u>	<u>3</u>	<u>1</u>

These are shown in red on Table I-A. They are read from the bottom up as explained on page ii.

Group I also contains 30 decade combinations. These are shown by red triangles on Table IV-B, section I. They are read from left to top as: 13 + 2, 14 + 6, etc.

The drill work for this group is tabulated on Table V, section I, page 87. The red triangles placed in the squares indicate the combinations included in this teaching group. That is, they are the combinations shown on Table IV, section I, page 86. They are the only combinations which should be used since they are the only ones which have been taught.

Results of Tabulations of Group I.

Table V-A, section I, page 87 shows that:

10 primary facts have been taught

0 primary facts have been used which have not been taught.

Table V-B, section I, shows that:

30 decade facts have been taught

0 decade facts have been used which have not been taught.

Table V-C, shows that:

13 higher decade facts have been taught.

0 higher decade facts have been used.

Table VI, shows that:

0 higher decade facts have been used beyond social and business usage.

[illegible text]

[illegible text]

[illegible text]

[illegible text]

[illegible text]

[illegible text]

[illegible text]

[illegible text]

[illegible text]

TEACHING GROUPS

* Group I Wilson

Primary or First Decade Facts

A

0 0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9
1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9
3 3 3 3 3 3 3	4 5 6 7 8 9
4 4 4 4 4 4	5 6 7 8 9
5 5 5 5 5	6 7 8 9
6 6 6 6	7 8 9
7 7 7	8 9
8 8	9
9	

B

+	0	1	2	3	4	5	6	7	8	9
10										
11		1								
12			2 3							
13			2							9
14					5 6					
15				4						
16				4						
17										
18										
19			3							
20										
21		1								
22			2 3							
23			2							9
24					5 6					
25				4						
26				4						
27										
28										
29			3							
30										
31		1								
32			2 3							
33			2							9
34					5 6					
35				4						
36				4						
37										
38										
39			3							

C

+	1	2	3	4	5	6	7	8
40								
42		X	X					
45				X				
48								
49			X					
54					X X			
56				X				
63		X						
64					X X			
72		X	X					
81	X							

* New group in red,
Cumulative groups in black.

TABLE V, Section I

Group I Wilson

Color for Examples, Black

Color for Problems, Red

A

+	0	1	2	3	4	5	6	7	8	9
0										
1		36								
2			33	43						
3			10						2	
4					23	6				
5					46					
6					5					
7										
8										
9				46						

B

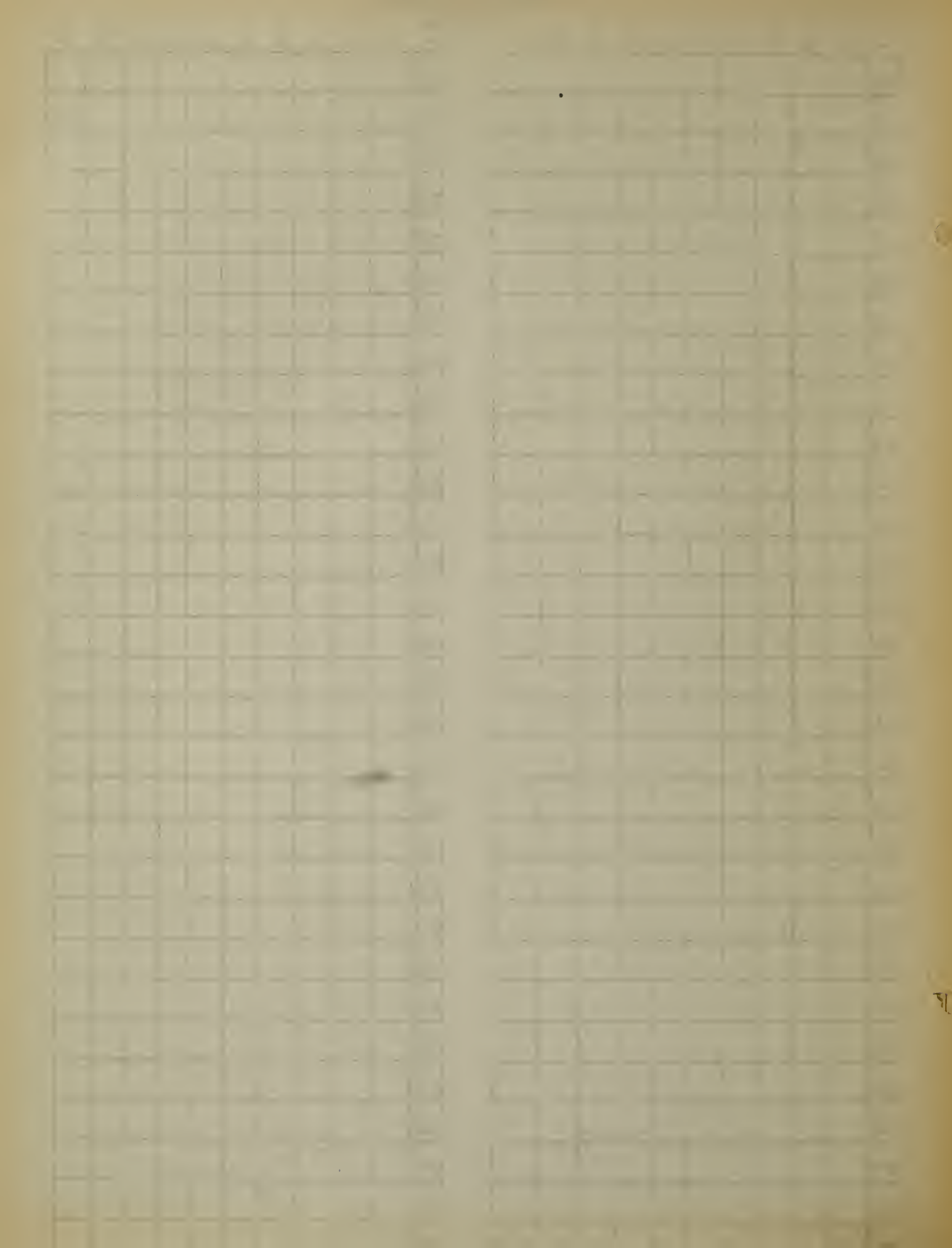
+	0	1	2	3	4	5	6	7	8	9
10										
11		1								
12			28	9						
13			1						1	
14					8	8				
15				4						
16				1						
17										
18										
19				3						
20										
21		1								
22			1	1						
23			1						1	
24					1	1				

+	0	1	2	3	4	5	6	7	8	9
25				1						
26				1						
27										
28										
29				1						
30										
31		1								
32			1	1						
33			1						1	
34					1	1				
35				1						
36				1						
37										
38										
39				1						

0 1 2 3 4 5 6 7 8 9

C

40										
42			1	1						
45				1						
48										
49				1						
54					1	1				
56				1						
63			1							
64					1	1				
72			1	1						
81		1								



Group II, page 12 in the text, includes the following primary combinations:

3	4	3	2	2	8	9	6	0	6
<u>6</u>	<u>9</u>	<u>3</u>	<u>6</u>	<u>8</u>	<u>2</u>	<u>4</u>	<u>2</u>	<u>0</u>	<u>3</u>

These are shown in red on Table V-A, section II. The first teaching group is also shown in this table but tabulated in black.

Group II also contains 30 decade combinations. These are shown by red triangles on Table V-B, section II.

The drill work for this group, text pages 12 and 13, is tabulated on Table V-A, B, C, section II page 92. The combinations in Table V-C, section II indicate those needed for carrying in multiplication beyond $39 + 9$. The combinations beyond $39 + 9$ with the exception of those needed for carrying in multiplication are tabulated in Table VI, section II page 93.

The black triangles on Table V indicate the combinations previously taught.

Results of Tabulations of Group II

Table V-A, section II page 92 shows that:

20 primary facts have been taught,

0 primary facts have been used that have not been taught.

Table V-B, section II page 92 shows that:

30 decade facts have been taught in this group,

30 decade facts have been taught in the previous group,

0 decade facts are used which have not been taught.

Table V-C, section II page 92 shows that:

22 higher decade combinations have been taught.

0 higher decade combinations have been used.

Table VI, section II page 93 shows that:

0 decade facts beyond social usage have been taught,

0 decade facts beyond $39 + 9$ have been used.

ORIGINAL ARTICLES

CONTENTS

1. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
2. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

3. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
4. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

5. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
6. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

7. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
8. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

9. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
10. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

11. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
12. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

13. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
14. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

15. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
16. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

17. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
18. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

19. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
20. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

21. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
22. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

23. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
24. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

25. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
26. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

27. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient
28. The Effect of the Diet on the Blood Sugar in the Normal Individual and in the Diabetic Patient

Table V-B, section II page 92

All the decade combinations up to $39 + 9$ have been taught. In this table I have allowed the author credit for his teaching combinations as drill combinations also. This allowance is made on account of the fact that he intends to teach them and yet lists them as drill and without answers. Taking these facts into consideration, it is only fair that this allowance should be made.

If we did not make this allowance, we would have to subtract one from each figure in every square in this table. If we do this, then the author has failed to use many of these decade combinations in the drill service. This would then be the weakest point in the whole drill service according to the author's aims.

Table V-C, section II page 92

In this table the author has been allowed credit for his teaching combinations as drill work as no answers are given and it is impossible to use these combinations in addition. They occur in multiplication problems only providing we keep within the social and business usage bounds that the author sets up in his introduction.

Table VI, section II page 93

This table is blank because the author claims that these combinations are beyond social and business usage limits as he has set them up in his introduction. He has not allowed his drill service to extend into these combinations in accordance with his aims.

* Group II Wilson

Primary or First Decade Facts

[illegible]

+	0	1	2	3	4	5	6	7	8	9
10	0									
11										
12			2	3			6		8	
13			2	3			6			9
14						5	6			9
15					4					
16			2	3	4					
17										
18			2							
19				3	4					
20	0									
21		1								
22			2	3			6		8	
23			2	3			6			9
24						5	6			9
25					4					
26			2	3	4					
27										
28			2							
29				3	4					
30	0									
31		1								
32			2	3			6		8	
33			2	3			6			9
34						5	6			9
35					4					
36			2	3	4					
37										
38			2							
39				3	4					

	+	1	2	3	4	5	6	7	8
40									
42			X	X			X		
45					X				
48			X						
49					X				
54						X	X		
56			X	X	X				
63			X	X			X		
64						X	X		
72			X	X			X		X
81	X								

* New group in red,
Cumulative groups in black.

Color for Examples, Black

Color for Problems, Red

	0	1	2	3	4	5	6	7	8	9
0	14									
1		31								
2			15	22			12		10	
3			6	22			14			
4					9	6			10	
5					28					
6			13	22	6					
7										
8			26							
9				21	31					

[illegible]

+	0	1	2	3	4	5	6	7	8	9
25										
26			1	1						
27										
28			1							
29					1					
30	1									
31										
32							1		1	
33				1			1			
34										1
35										
36			1	1						
37										
38			1							
39					1					
	0	1	2	3	4	5	6	7	8	9

C

40							
42						1	
45							
48			1				
49				1			
54							
56			1	1			
63				1		1	
64							
72						1	1
81							

[illegible][illegible]

Group III

Group III, in the text, page 14 includes the following combinations:

2	8	4	5	7	3	8	6	4	3
<u>4</u>	<u>6</u>	<u>4</u>	<u>8</u>	<u>3</u>	<u>7</u>	<u>5</u>	<u>8</u>	<u>2</u>	<u>0</u>

These are shown in red, Table IV, section III page 95. The preceding groups are shown in black. The teaching tables are always cumulative. They show all the primary combinations that have been taught.

The drill work for this group, pages 14 and 15 in the text, is tabulated on Table V-A, B, C, section III page 96 and Table VI, page 97 .

Results of Tabulations of Group III

Table V-A, section III page 96 shows that:

30 primary facts have been taught,

0 primary facts have been used which have not been taught.

Table V-B, section III page 96 shows that:

90 decade facts have been taught,

0 decade facts have been used which have not been taught.

Table V-C, section III page 96 shows that:

33 facts needed for carrying in multiplication have been taught,

0 higher decade facts have been used.

Table VI, section III page 97 shows that:

0 higher decade combinations have been used.

TEACHING GROUPS

* Group III Wilson

B

Primary or First Decade Facts

A

[illegible]

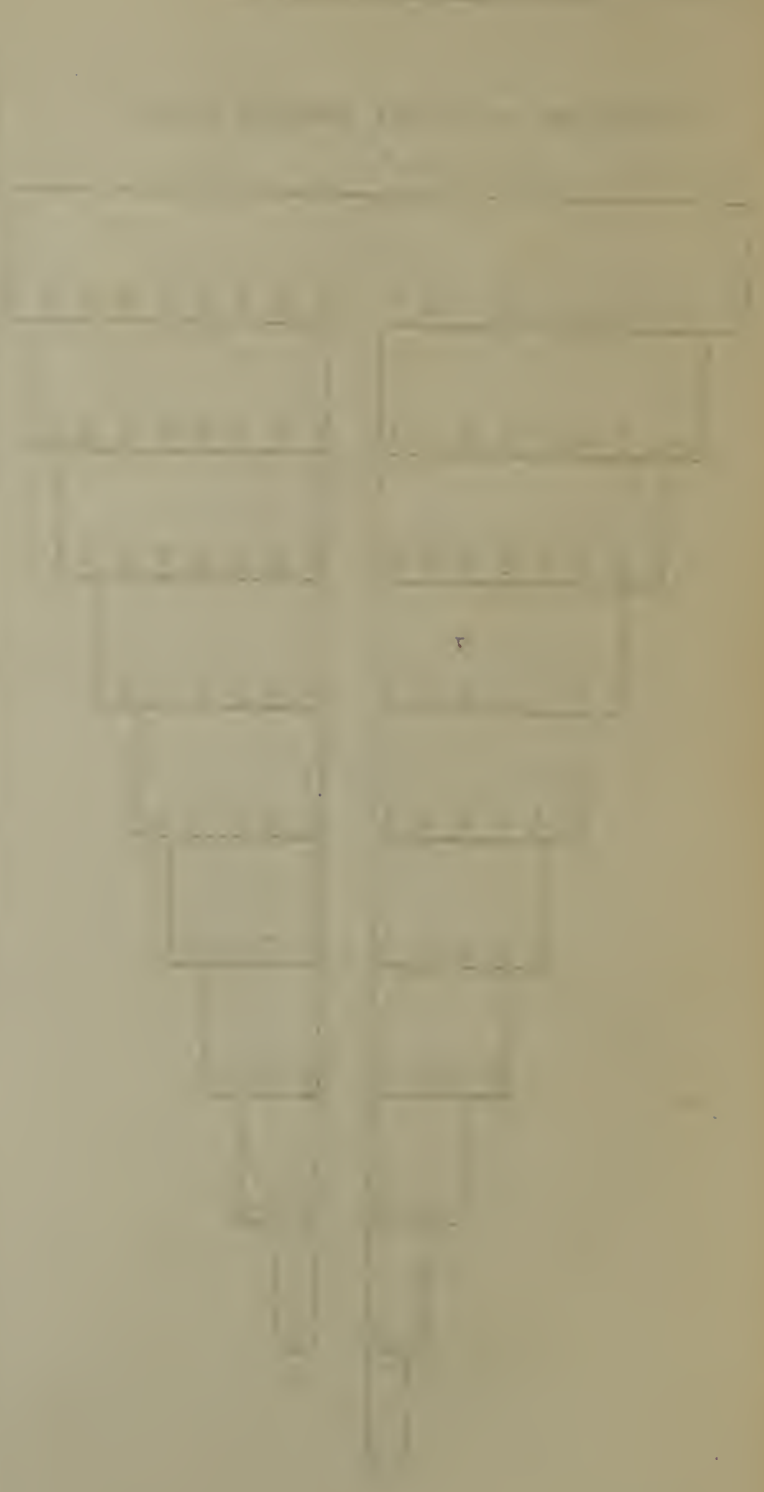
	+	0	1	2	3	4	5	6	7	8	9
10	0			3							
11											
12				2	3	4		6		8	
13				2	3			6	7		9
14				2		4	5	6			9
15						4				8	
16				2	3	4				8	
17					3						
18				2			5	6			
19					3	4					
20	0				3						
21		1									
22				2	3	4					
23				2	3			6	7		9
24				2		4	5	6			9
25						4				8	
26				2	3	4				8	
27					3						
28				2			5	6			
29					3	4					
30	0				3						
31		1									
32				2	3	4		6		8	
33				2	3			6	7		9
34				2		4	5	6			9
35										8	
36				2	3	4				8	
37					3						
38				2			5	6			
39					3	4					

C

	+	1	2	3	4	5	6	7	8
40				X					
42			X	X	X		X		
45					X				
48			X				X	X	X
49				X	X				
54			X		X	X	X		
56			X	X	X				
63			X	X			X		X
64			X		X	X	X		
72			X	X	X		X		X
81	X								

* New group in red,
Cumulative groups in black.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

TABLE V Section III

Color for Examples, Black

Color for Problems, Red

Group III Wilson

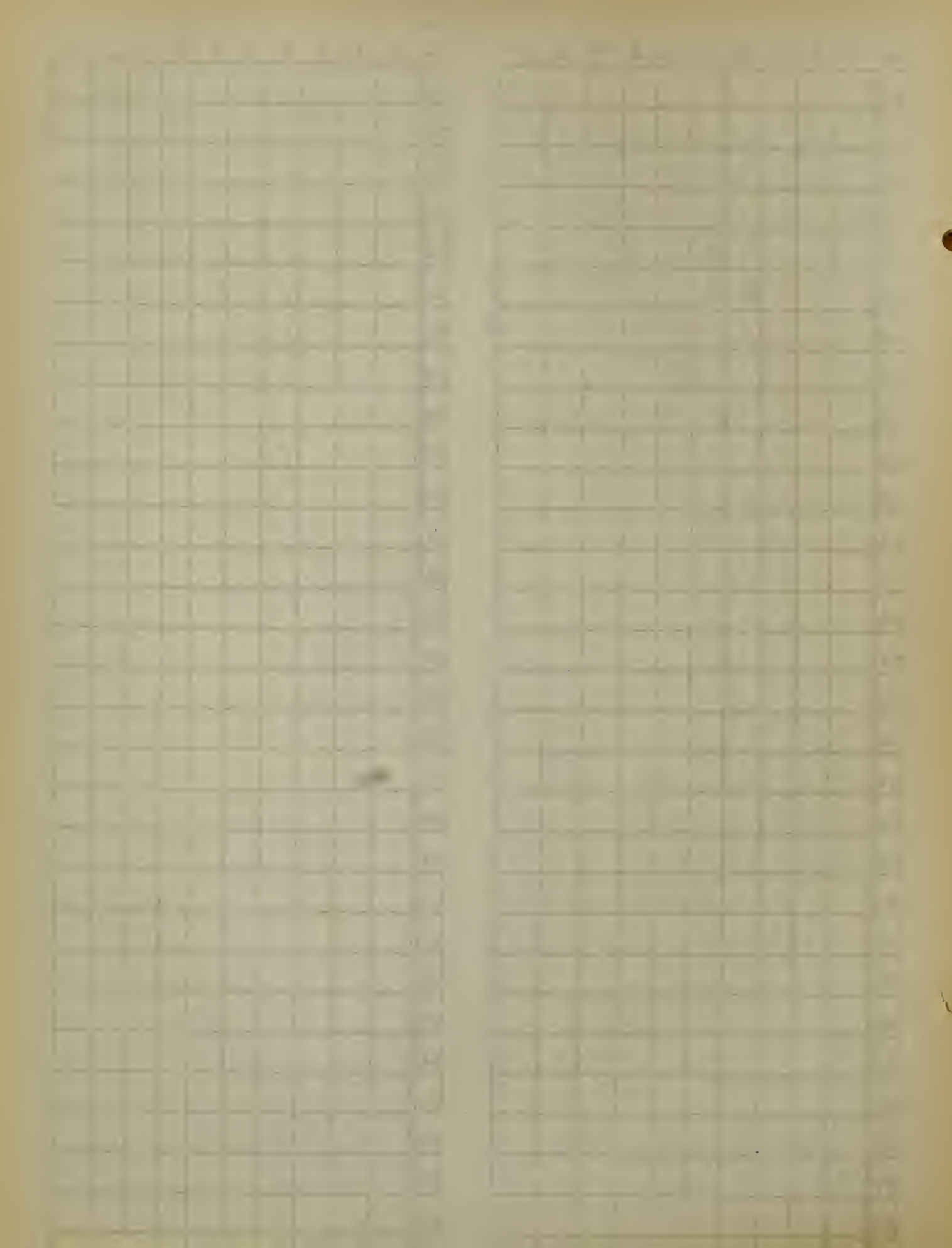
	0	1	2	3	A 4	5	6	7	8	9
0	7			10						
1		29								
2			11	14	15		15		6	
3			11	6			8	6		3
4			10		7	6	1			5
5					14				6	
6			11	7	4				12	
7				2						
8			5			8	13			
9				6	9					

	0	1	2	3	4	5	6	7	8	9
10	8			13						
11										
12					4				1	
13			5	4			3	6		3
14			8		4	2	1			2
15					1				2	
16					3				3	
17				1						
18						1	1			
19				1	4					
20	4			5						
21										
22				1	1					
23							3	1		3
24			1		2					1

	0	1	2	3	4	5	6	7	8	9
25									1	
26									1	
27				1						
28						1	2			
29				1						
30				1						
31										
32				1	2					
33								1		
34			1		1					
35									1	
36									1	
37				1						
38						1	1			
39										

	0	1	2	3	4	5	6	7	8	9
40				1						
42					1					
45									1	
48						1	1			
49										
54			1		1					
56										
63									1	
64			1		1					
72					1					
81										

[illegible][illegible]



Group IV

Group IV, in the text, page 16, includes the following combinations:

2	6	5	7	5	8	3	7	5	0
<u>5</u>	<u>7</u>	<u>3</u>	<u>8</u>	<u>5</u>	<u>7</u>	<u>5</u>	<u>6</u>	<u>2</u>	<u>3</u>

These are shown in red on Table IV-A, page 99 .

The drill work for this group, pages 16 and 17 in the text, is tabulated on Table V-A, B, C, section IV page 100 and on Table VI, section IV page 101.

Results of Tabulations of Group IV

Table V-A, section IV, page 100 shows that:

40 primary facts have been taught,

0 primary facts have been used which have not been taught.

Table V-B, section IV, page 100 shows that:

120 decade facts have been taught,

0 decade facts have been used that have not been taught.

Table V-C, section IV, page 100 shows that:

41 higher decade facts needed for carrying in multiplication
have been taught,

0 higher decade facts have been used.

Table VI, section IV, page 101 shows that:

0 combinations beyond social and business usage are taught,

0 combinations beyond social and business usage are used.

THE UNIVERSITY OF CHICAGO
LIBRARY

1911

THE UNIVERSITY OF CHICAGO
LIBRARY

THE UNIVERSITY OF CHICAGO
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THE UNIVERSITY OF CHICAGO
LIBRARY

THE UNIVERSITY OF CHICAGO
LIBRARY

THE UNIVERSITY OF CHICAGO
LIBRARY

TEACHING GROUPS

* Group IV Wilson

Primary or First Decade Facts

A

0 3	
0 0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9
1	
1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9
2 3 6 8 4 5	
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9
2 3 6 9 7 0 5	
3 3 3 3 3 3 3	3
5 6 9 2 4	
4 4 4 4 4 4	4
4 8 2 3 5	
5 5 5 5 5	5
2 3 8 7	
6 6 6 6	6
3 6 8	
7 7 7	7 8 9
2 7	
8 8	8 9
	9

B

	+	0	1	2	3	4	5	6	7	8	9
10		0			3						
11											
12				2	3	4	5	6		8	
13		0		2	3		5	6	7		9
14				2		4	5	6			9
15				2	3	4	5			8	
16				2	3	4			7	8	
17					3			6		8	
18				2			5	6	7		
19					3	4					
20		0			3						
21			1								
22				2	3	4	5	6		8	
23		0		2	3		5	6	7		9
24				2		4	5	6			9
25				2	3	4	5			8	
26				2	3	4			7	8	
27					3			6		8	
28				2			5	6	7		
29					3	4					
30		0			3						
31			1								
32				2	3	4	5	6		8	
33		0		2	3		5	6	7		
34				2		4	5	6			
35				2	3		5			8	
36				2	3	4			7	8	
37					3			6		8	
38				2			5	6	7		
39					3	4					

C

	+	1	2	3	4	5	6	7	8
40				X					
42			X	X	X	X	X		
45			X	X	X	X			X
48			X			X	X	X	
49				X	X				
54			X		X	X	X		
56			X	X	X			X	
63			X	X		X	X		X
64			X		X	X	X		
72			X	X	X	X	X		X
81	X								

* New group in red,
Cumulative groups in black.

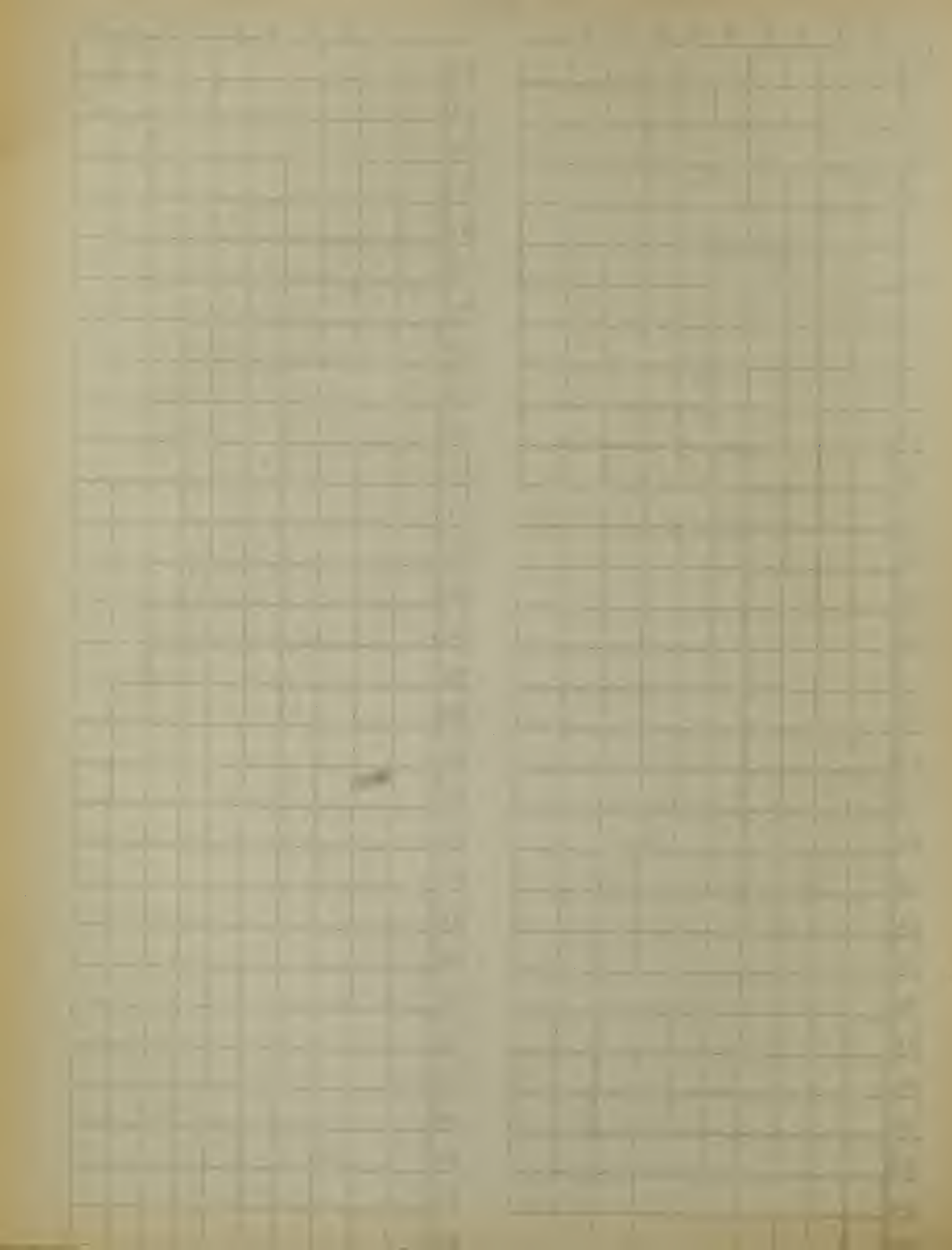
Table with multiple rows and columns, containing handwritten entries. The table structure is complex, with varying numbers of columns per row.

Table with multiple rows and columns, containing handwritten entries. The table structure is complex, with varying numbers of columns per row.

Table with multiple rows and columns, containing handwritten entries. The table structure is complex, with varying numbers of columns per row.

Table with multiple rows and columns, containing handwritten entries. The table structure is complex, with varying numbers of columns per row.

[illegible][illegible]



Group V

Group V, in the text, page 18, includes the following primary combinations:

7	6	7	4	6	8	9	2	9	1
<u>9</u>	<u>6</u>	<u>2</u>	<u>8</u>	<u>1</u>	<u>4</u>	<u>9</u>	<u>7</u>	<u>7</u>	<u>6</u>

These are shown in red on Table IV, section V page 103 .

The drill work for this group, pages 18 and 19 in the text, is tabulated on Table V, -A, B, C, section V page 104 and on Table VI, section VI, page 105 .

Results of Tabulations of Group V

Table V-A, section V page 104 shows that:

50 primary facts have been taught,

0 primary facts have been used which have not been taught.

Table V-B, section V page 104 shows that:

150 decade facts have been taught,

0 decade fact has been used which has not taught.

Table V-C, section V, page 104 shows that:

47 higher decade facts needed in carrying in multiplication
have been taught,

0 higher decade facts have been used.

Table VI, section V page 105 shows that:

0 combinations beyond social and business usage are taught,

0 combinations beyond social and business usage are used.



TEACHING GROUPS

* Group V Wilson

Primary or First Decade Facts

A																			
0	3									9									
0	0	0	0	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	
1																			
1	1	1	1	1	1	1	1	1	1	2	3	4	5	6	7	8	9		
2	3	4	5	6	7	8													
2	2	2	2	2	2	2	2	2	2	3	4	5	6	7	8	9			
2	3	6	9	7	0	5													
3	3	3	3	3	3	3	3			4	5	6	7	8	9				
5	6	9	2	4	8					6									
4	4	4	4	4	4	4				5	6	7	8	9					
4	8	2	3	5						1	9	5							
5	5	5	5	5	5					6	7	8	9						
2	3	8	7							2	6								
6	6	6	6							7	8	9							
3	6	8								4									
7	7	7								8	9								
2	7									9									
8	8									9									
7																			
9																			

B																			
+	0	1	2	3	4	5	6	7	8	9									
10	0			3															
11							6												
12			2	3	4	5	6	7	8										
13	0		2	3		5	6	7		9									
14			2		4	5	6		8	9									
15			2	3	4	5			8										
16		1	2	3	4		6	7	8										
17			2	3			6		8										
18			2		4	5	6	7											
19				3	4			7		9									
20	0			3															
21		1					6												
22			2	3	4	5	6	7	8										
23	0		2	3		5	6	7		9									
24			2		4	5	6		8	9									
25			2	3	4	5			8										
26		1	2	3	4		6	7	8										
27			2	3			6		8										
28			2		4	5	6	7											
29				3	4			7		9									
30	0			3															
31		1					6												
32			2	3	4	5	6	7	8										
33	0		2	3		5	6	7		9									
34			2		4	5	6		8	9									
35			2	3		5			8										
36		1	2	3	4		6	7	8										
37			2	3			6		8										
38			2		4	5	6	7											
39				3	4			7		9									

C																			
+	1	2	3	4	5	6	7	8											
40			X																
42		X	X	X	X	X													
45		X	X	X	X			X											
48		X		X	X	X	X												
49			X	X															
54		X		X	X	X		X											
56	X	X	X	X		X	X												
63		X	X		X	X	X												
64		X		X	X	X													
72		X	X	X	X	X	X	X											
81	X					X													

* New group in red,
Cumulative groups in black.

Group V Wilson

Color for Examples, Black

Color for Problems, Red

A

+	0	1	2	3	4	5	6	7	8	9
0	4			7						
1		15					31			
2			6	6	10	14	3	22	3	
3	11		8	12		4	5	3		
4			3		4	3	1		7	
5			5	4	1	10			1	
6		21	8	4	4		12	3	1	
7			43	4			4		6	20
8			1		13	4	2	3		
9				2	5			18		32

B

+	0	1	2	3	4	5	6	7	8	9
10	12			23						
11							1			
12			1	3	2	1		11		
13	13		4	8		7	2	1		5
14			2						2	1
15			1	2	1	8				
16		7	3	1			12	3	4	
17			1	1			1			1
18			2		11		3	6		
19				1				4		5
20	3			4						
21							1			
22				2			1	10	2	
23	2					2	1	1		
24			1		1				2	1

+	0	1	2	3	4	5	6	7	8	9
25			2			2				
26			1					3		
27				1						1
28					2		2			
29								4		2
30				1						
31							1			
32				1				1		
33				1						
34						1			1	
35									1	
36			2					1		
37				1						1
38					2					
39									1	1

C

40										
42										
45										
48				1						
49										
54									1	
56		1					1			
63										
64										
72									1	
81							1			

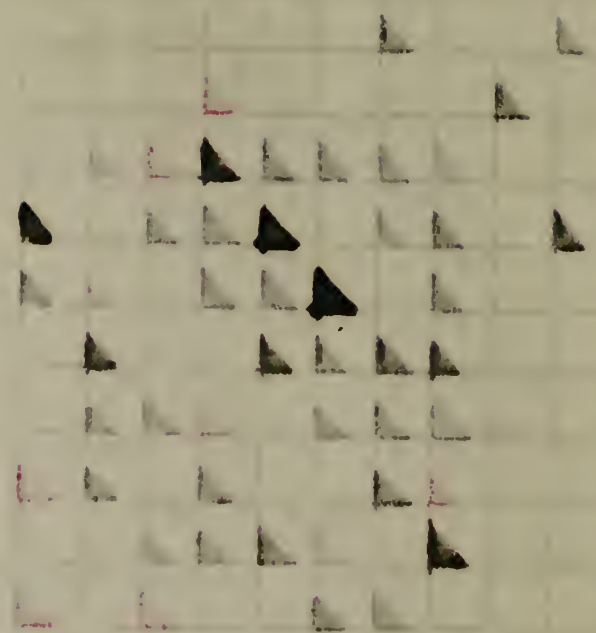
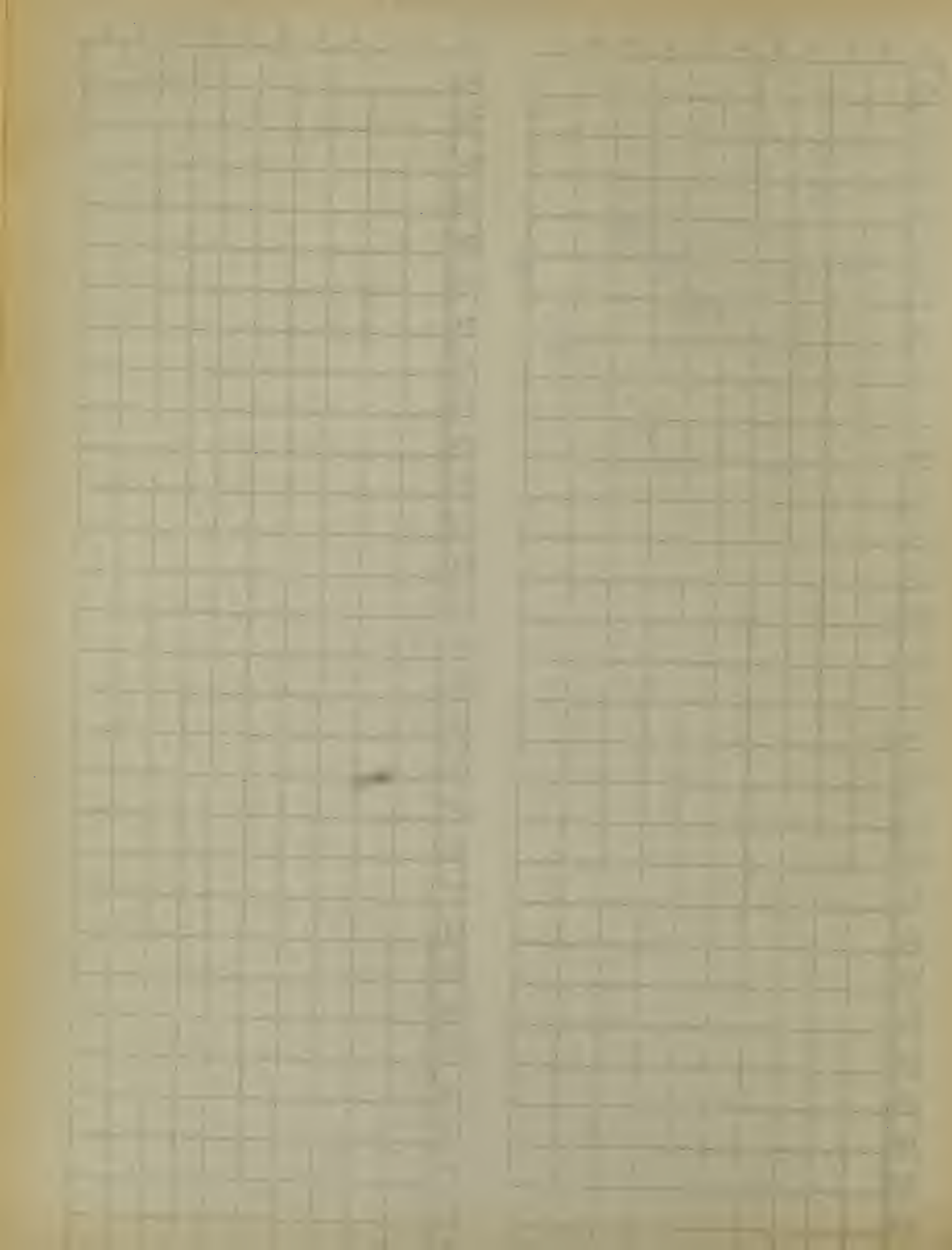


TABLE VI Section V
Wilson

[illegible][illegible]



Group VI

Group VI, in the text, page 20, includes the following primary combinations:

7	3	5	9	9	2	7	1	4	9
<u>7</u>	<u>4</u>	<u>7</u>	<u>2</u>	<u>1</u>	<u>9</u>	<u>5</u>	<u>9</u>	<u>3</u>	<u>0</u>

These are shown in red on Table IV, section VI, page 107.

The drill work for this group, pages 20 and 21 in the text, is tabulated on Table V-A, B, C, section VI page 108 and on Table VI, section VI page 109.

Results of Tabulations of Group VI

Table V-A, section VI page 108 shows that:

60 primary facts have been taught,

0 primary facts have been used which have not been taught.

Table V-B, section VI page 108 shows that:

180 decade facts have been taught,

0 decade fact has been used which has not been taught.

Table V-C, section VI page 108 shows that:

53 higher decade facts needed in carrying in multiplication
have been taught,

0 higher decade fact has been used.

Table VI, section VI page 109 shows that:

0 facts beyond social and business usage are taught,

0 facts beyond social and business usage are used.



TEACHING GROUPS

* Group VI Wilson

TABLE IV Section VI

B

Primary or First Decade Facts

A

0 3 9	0 0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9
1 6 9	1 1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9
2 3 4 5 6 7 8 9	2 2 2 2 2 2 2 2 2 2	3 4 5 6 7 8 9
0 2 3 5 6 7 9	3 3 3 3 3 3 3 3 3 3	4 5 6 7 8 9
2 4 5 6 8 9	4 4 4 4 4 4 4 4 4 4	5 6 7 8 9
4 8 2 3 5	5 5 5 5 5 5 5 5 5 5	6 7 8 9
2 3 7 8	6 6 6 6 6 6 6 6 6 6	7 8 9
3 6 8	7 7 7 7 7 7 7 7 7 7	8 9
2 7	8 8 8 8 8 8 8 8 8 8	9
7	9 9 9 9 9 9 9 9 9 9	

+	0	1	2	3	4	5	6	7	8	9
10	0			3						9
11		1					6			9
12			2	3	4	5	6	7	8	9
13	0		2	3	4	5	6	7	8	9
14			2	3	4	5	6	7	8	9
15			2	3	4	5	6	7	8	9
16		1	2	3	4	5	6	7	8	9
17			2	3	4	5	6	7	8	9
18			2	3	4	5	6	7	8	9
19		1	2	3	4	5	6	7	8	9
20	0			3						9
21		1					6			9
22			2	3	4	5	6	7	8	9
23	0		2	3	4	5	6	7	8	9
24			2	3	4	5	6	7	8	9
25			2	3	4	5	6	7	8	9
26		1	2	3	4	5	6	7	8	9
27			2	3	4	5	6	7	8	9
28			2	3	4	5	6	7	8	9
29		1	2	3	4	5	6	7	8	9
30	0			3						9
31		1					6			9
32			2	3	4	5	6	7	8	9
33	0		2	3	4	5	6	7	8	9
34			2	3	4	5	6	7	8	9
35			2	3	4	5	6	7	8	9
36		1	2	3	4	5	6	7	8	9
37			2	3	4	5	6	7	8	9
38			2	3	4	5	6	7	8	9
39		1	2	3	4	5	6	7	8	9

C

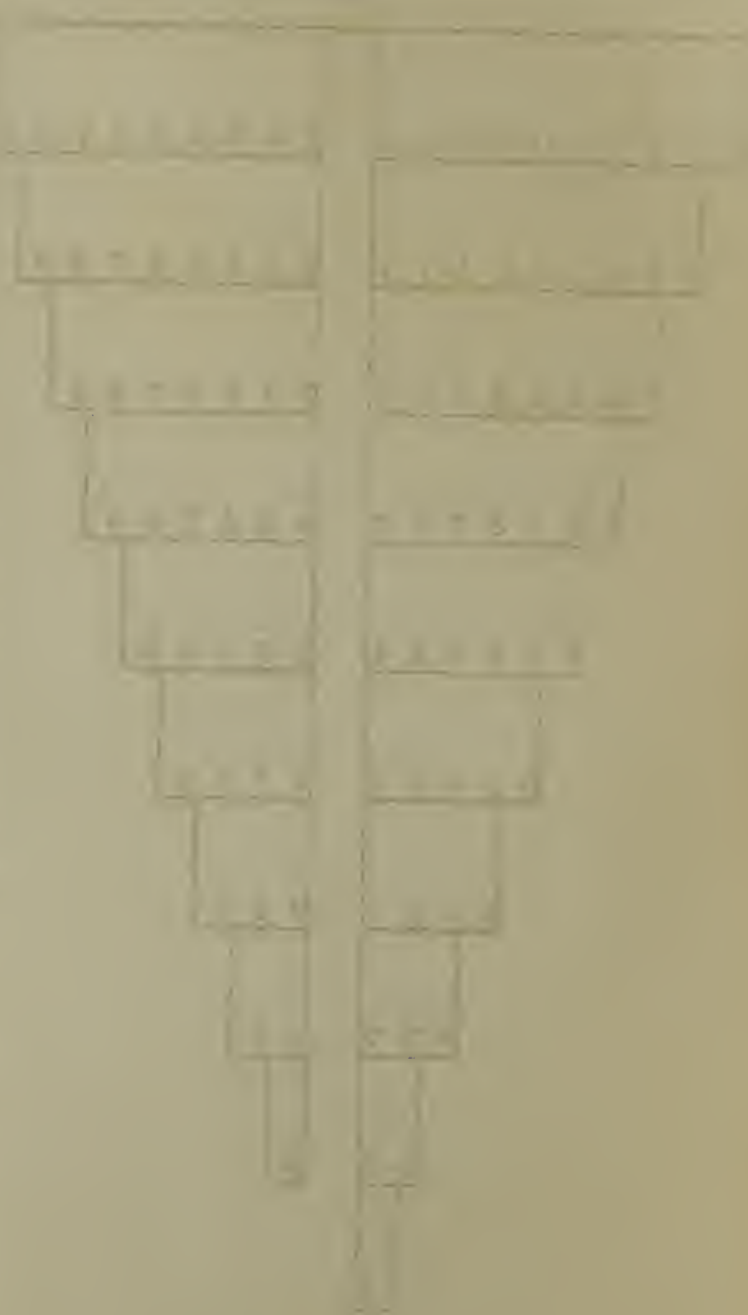
+	1	2	3	4	5	6	7	8
40			X					
42		X	X	X	X	X		
45		X	X	X	X		X	X
48		X		X	X	X	X	
49	X	X	X	X				
54		X	X	X	X	X		X
56	X	X	X	X		X	X	
63		X	X	X	X	X	X	
64		X	X	X	X	X		
72		X	X	X	X	X	X	X
81	X					X		

* New group in red,
Cumulative groups in black.

CLASSICAL MUSIC

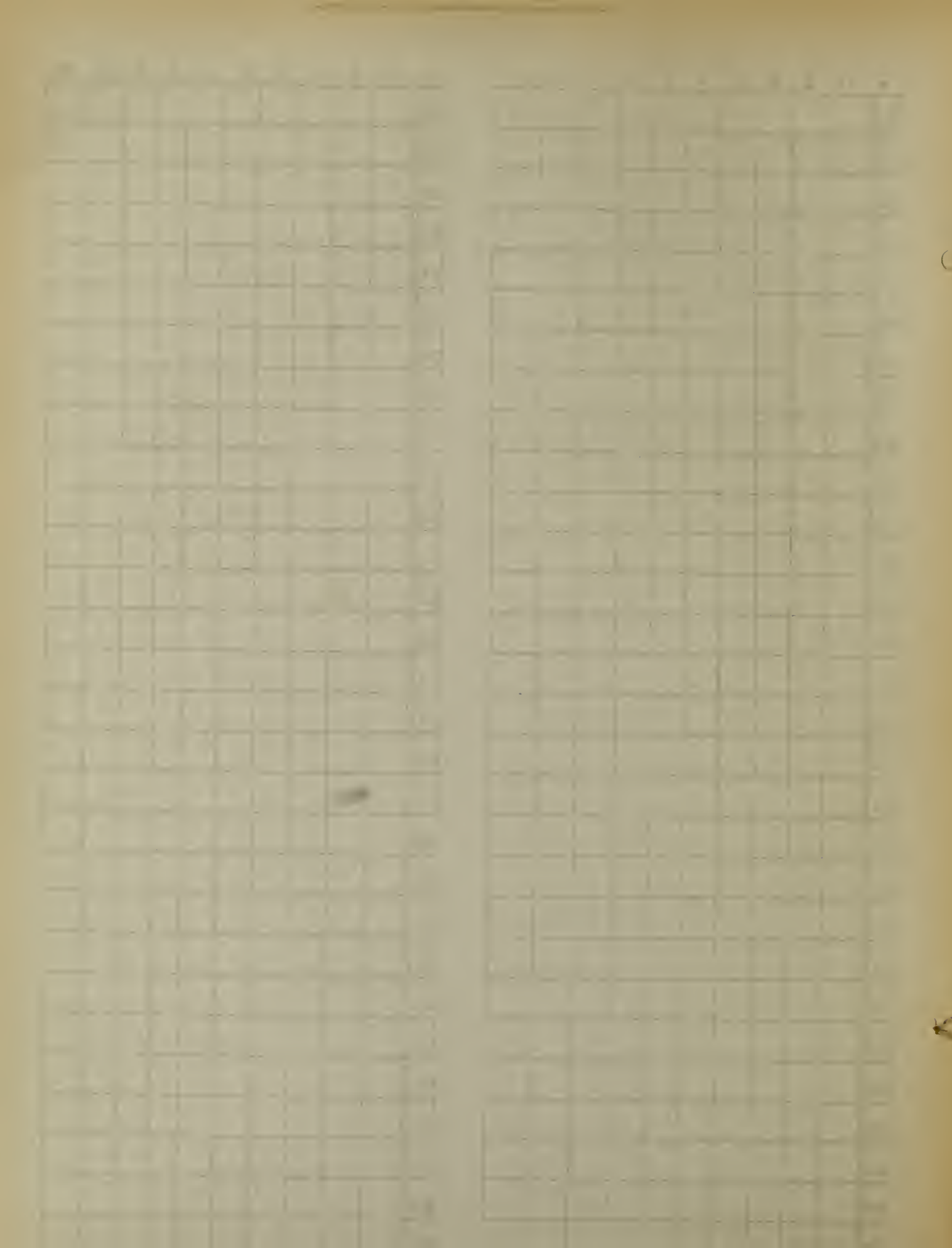
Handwritten notes and a signature at the top of the page.

Handwritten title or subtitle for the musical score.



40							
42							
45							1
48							
49		1	1				
54				1			
56							
63					1		
64				1			
72							
81							

[illegible][illegible]



Group VII

Group VII, in the text, page 22, includes the following primary combinations:

8	9	6	7	9	8	1	5	6	0
<u>8</u>	<u>6</u>	<u>5</u>	<u>1</u>	<u>8</u>	<u>9</u>	<u>7</u>	<u>6</u>	<u>9</u>	<u>9</u>

These are shown in red on Table IV, section VII, page 111.

The drill work for this group, pages 22 and 23 in the text, is tabulated on Table V-A, B, C, section VII, page 112 and on Table VI, section VII, page 113 .

Results of Tabulations of Group VII

Table V-A, section VII, page 112 shows that:

70 primary facts have been taught,

0 primary facts have been used which have not been taught.

Table V-B, section VII, page 112 shows that:

210 decade facts have been taught,

0 decade facts have been used which have not been taught.

Table V-C, section VII, page 112 shows that:

57 higher decade facts needed for carrying in multiplication have been taught,

0 higher decade facts have been used.

Table VI, section VII, page 113 shows that:

0 facts beyond social and business usage are taught,

0 facts beyond social and business usage are used.

- 111 -
TABLE IV Section VII

TEACHING GROUPS

* Group VII Wilson

Primary or First Decade Facts

A

0 3 9	9	8 0
0 0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9	
1 6 7 9	5 1 9	
1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9	
2 3 4 5 6 7 8 9	9 6 9 8	
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9	
0 2 3 4 5 6 7	9 8 9 7	
3 3 3 3 3 3 3	4 5 6 7 8 9	
2 3 4 5 6 8	8 7 8 4	
4 4 4 4 4 4	5 6 7 8 9	
2 3 4 5 7	6 7 7 3	
5 5 5 5 5	6 7 8 9	
1 2 3 4	6 6 2	
6 6 6 6	7 8 9	
2 3 5	5 6	
7 7 7	8 9	
2 4	1	
8 8	9	
9		
9		

B

+	0	1	2	3	4	5	6	7	8	9
10	0			3						9
11		1					6	7		9
12			2	3	4	5	6	7	8	9
13	0		2	3	4	5	6	7		9
14			2	3	4	5	6		8	9
15			2	3	4	5	6	7	8	
16		1	2	3	4	5	6	7	8	9
17		1	2	3		5	6	7	8	9
18			2		4	5	6	7	8	9
19	0	1	2	3	4		6	7	8	9
20	0			3						9
21		1					6	7		9
22			2	3	4	5	6	7	8	9
23	0		2	3	4	5	6	7		9
24			2	3	4	5	6			9
25			2	3	4	5	6	7	8	
26		1	2	3	4	5	6	7	8	9
27		1	2	3		5	6	7	8	9
28			2		4	5	6	7	8	9
29	0	1	2	3	4		6	7	8	9
30	0			3						9
31		1					6	7		9
32			2	3	4	5	6	7	8	9
33	0		2	3	4	5	6	7		9
34			2	3	4	5	6			9
35			2	3	4	5	6	7	8	
36		1	2	3	4	5	6	7	8	9
37		1	2	3		5	6	7	8	9
38			2		4	5	6	7	8	9
39	0	1	2	3	4		6	7	8	9

C

+	1	2	3	4	5	6	7	8
40			X					
42		X	X	X	X	X		
45		X	X	X	X	X	X	X
48		X		X	X	X	X	
49	X	X	X	X		X		
54		X	X	X	X	X		X
56	X	X	X	X	X	X	X	
63		X	X	X	X	X	X	
64		X	X	X	X	X		
72		X	X	X	X	X	X	X
81	X					X	X	

* New group in red,
Cumulative groups in black.

VII Wilson

Color for Examples, Black

Color for Problems, Red

A

+	0	1	2	3	4	5	6	7	8	9
0	9			2						4
1		9					8	14		1
2			9	7	5	6	4	3	1	7
3	9		6	4	15	2	3	1		2
4			1	4	2	1			1	
5			8		4	1	7	1	1	
6		2	3	8		9			1	8
7		23	5	4		3	6	6		4
8			3			1	3		15	18
9	31	4	3	3	1		13	1	11	1

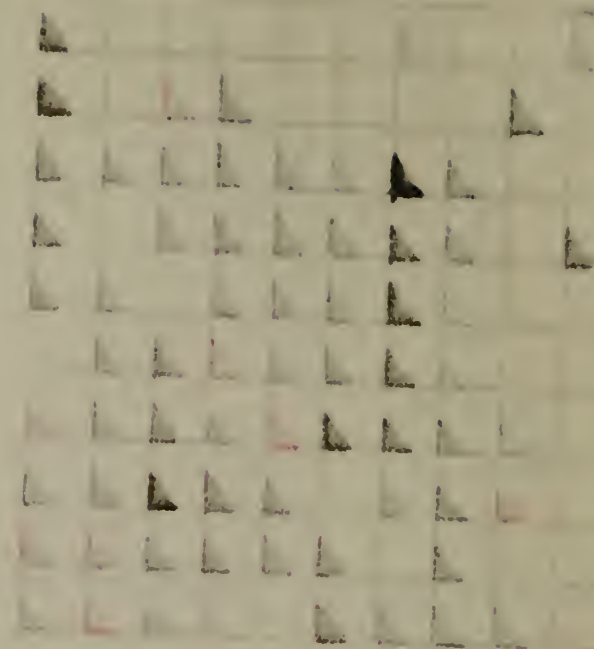
B

[illegible]

+	0	1	2	3	4	5	6	7	8	9
25							4			
26			1			2	1			2
27		1		1			1	1		1
28							1		2	5
29	1	1					3		1	
30										1
31		2						6		
32							1			
33										
34										
35			1				1			
36						1				1
37		1								
38									1	1
39	1						1		1	
	0	1	2	3	4	5	6	7	8	9

C

40							
42							
45						1	
48							
49						1	
54							
56						1	
63							
64							
72							
81							1



[illegible][illegible]



Group VIII

Group VIII, in the text, page 24, includes the following primary combinations:

1	5	7	2	8	3	1	4	9	8
<u>8</u>	<u>9</u>	<u>4</u>	<u>1</u>	<u>3</u>	<u>8</u>	<u>2</u>	<u>7</u>	<u>5</u>	<u>1</u>

These are shown in red on Table IV, section VIII, page 115.

The drill work for this group, pages 24 and 25 in the text, is tabulated on Table V-A, B, C, section VIII page 116 and on Table VI, section VIII, page 117 .

Results of Tabulations of Group VIII

Table V-A, section VIII, page 116 shows that:

80 primary facts have been taught,

0 primary facts have been used which have not been taught.

Table V-B, section VIII, page 116 shows that:

240 decade facts have been taught,

0 decade facts have been used which have not been taught.

Table V-C, section VIII, page 116 shows that:

67 higher decade facts have been taught,

0 higher decade facts have been used.

Table VI, section VIII, page 117 shows that:

0 facts beyond social and business usage are taught,

0 facts beyond social and business usage are used.

Primary or First Decade Facts

A

0	3	9	9	8	0
0	0	0	0	0	0
1	2	7	8	9	1
1	1	1	1	1	1
2	3	4	5	6	7
2	2	2	2	2	2
0	2	3	4	5	6
3	3	3	3	3	3
2	3	4	5	6	8
4	4	4	4	4	4
2	3	4	5	7	6
5	5	5	5	5	6
1	2	3	4	6	6
6	6	6	6	7	8
2	3	5	5	6	5
7	7	7	8	9	1
2	4	8	8	9	9
9	9				

B

	+	0	1	2	3	4	5	6	7	8	9
10	0				3						9
11			1	2				6	7	8	9
12			1	2	3	4	5	6	7	8	9
13	0			2	3	4	5	6	7	8	9
14				2	3	4	5	6	7	8	9
15				2	3	4	5	6	7	8	9
16			1	2	3	4	5	6	7	8	9
17			1	2	3	4	5	6	7	8	9
18			1	2	3	4	5	6	7	8	9
19	0	1	2	3	4	5	6	7	8	9	
20	0				3						9
21			1	2				6	7	8	9
22			1	2	3	4	5	6	7	8	9
23	0			2	3	4	5	6	7	8	9
24				2	3	4	5	6	7		9
25				2	3	4	5	6	7	8	9
26			1	2	3	4	5	6	7	8	9
27			1	2	3	4	5	6	7	8	9
28			1	2	3	4	5	6	7	8	9
29	0	1	2	3	4	5	6	7	8	9	
30	0				3						9
31			1	2				6	7	8	9
32			1	2	3	4	5	6	7	8	9
33	0			2	3	4	5	6	7	8	9
34				2	3	4	5	6	7		9
35				2	3	4	5	6	7	8	9
36			1	2	3	4	5	6	7	8	9
37			1	2	3	4	5	6	7	8	9
38			1	2	3	4	5	6	7	8	9
39	0	1	2	3	4	5	6	7	8	9	

	+	1	2	3	4	5	6	7	8
40				X					
42	X		X	X	X	X	X		
45			X	X	X	X	X		
48	X		X	X	X	X	X	X	X
49	X		X	X	X	X	X		
54			X	X	X	X	X	X	X
56	X		X	X	X	X	X	X	
63			X	X	X	X	X	X	X
64			X	X	X	X	X	X	
72	X		X	X	X	X	X	X	X
81	X		X				X	X	X

* New group in red,
Cumulative groups in black.

TABLE V Section VIII

Group VIII Wilson

Color for Examples, Black

Color for Problems, Red

A

+	0	1	2	3	4	5	6	7	8	9
0	7			2						2
1		5	13				3	4	15	2
2		27	3	2	2	1		1	2	1
3		16		7	11	2	7	3		17
4					2	2		6	1	
5			5	1	3					5
6			3	7			1		1	1
7			3	4		7				1
8			17	1	5			1	2	2
9		5			1	3	20	3	1	1

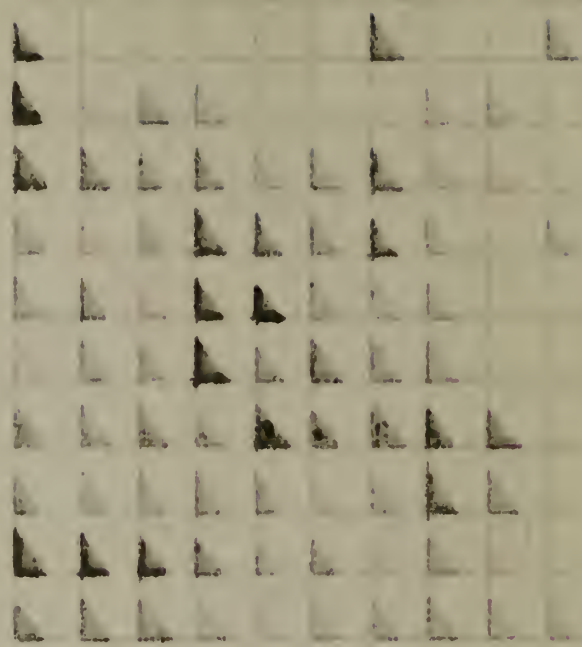
+	0	1	2	3	4	5	6	7	8	9
25						1				1
26							1			
27					1					1
28		1		1						1
29					1	2	2		1	
30										
31			1						1	
32		1	1							
33					1				1	
34								1		
35										1
36										
37					1					
38		1		1						
39						1				

B

+	0	1	2	3	4	5	6	7	8	9
10				2						2
11			15				2		10	1
12		1						1		
13	1		2	1	2			1	6	
14					2			11		1
15						1		1		3
16				1	2		1			
17					1		2	1		
18		1	1	1						
19	1					6	2	1		
20	1									3
21			7					2	4	
22		1								
23					1	1			2	
24						1		2		1

C

+	0	1	2	3	4	5	6	7	8	9
40										
42		1								
45										
48		1		1						
49						1				
54								1		
56										
63									1	
64								1		
72		1								
81			1							1



[illegible][illegible]

Group IX

Group IX, in the text, page 26, includes the following primary combinations:

2	0	3	5	0	0	1	1	0	4
<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>4</u>	<u>2</u>	<u>0</u>	<u>3</u>	<u>5</u>	<u>0</u>

These are shown in red on Table IV, section IX, page 119.

The drill work for this group, pages 26 and 27 in the text, is tabulated on Table V-A, B, C, section IX, page 120 and on Table VI, section IX, page 121.

Results of Tabulation of Group IX

Table V-A, section IX, page 120 shows that:

90 primary facts have been taught,

0 primary facts have been used which have not been taught,

Table V-B, section IX, page 120 shows that:

270 decade facts have been taught,

0 decade facts have been used which have not been taught.

Table V-C, section IX, page 120 shows that:

73 higher decade facts have been taught,

0 higher decade facts have been used,

Table VI, section IX, page 121 shows that:

0 facts beyond social and business usage are taught,

0 facts beyond social and business usage are used.

- 119 -
TABLE IV Section IX

TEACHING GROUPS

* Group IX Wilson

Primary or First Decade Facts

A

0 3 9 1 2 4 5	1 9	8 0
0 0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9	
1 2 6 7 8 0 3	0 1 0 0 5 1 9 5	
1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9	
2 3 4 5 6 7 8 9	8 7 6 9 4 1 8	
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9	
0 2 3 4 5 6 7	9 9 8 9 3 7	
3 3 3 3 3 3 3	4 5 6 7 8 9	
2 3 4 5 6 8	8 7 8 4	
4 4 4 4 4 4	5 6 7 8 9	
2 3 4 5 7	6 7 7 3	
5 5 5 5 5	6 7 8 9	
1 2 3 4	6 6 2	
6 6 6 6	7 8 9	
2 3 5	5 6	
7 7 7	8 9	
2 4	1	
8 8	9	
9		
9		

B

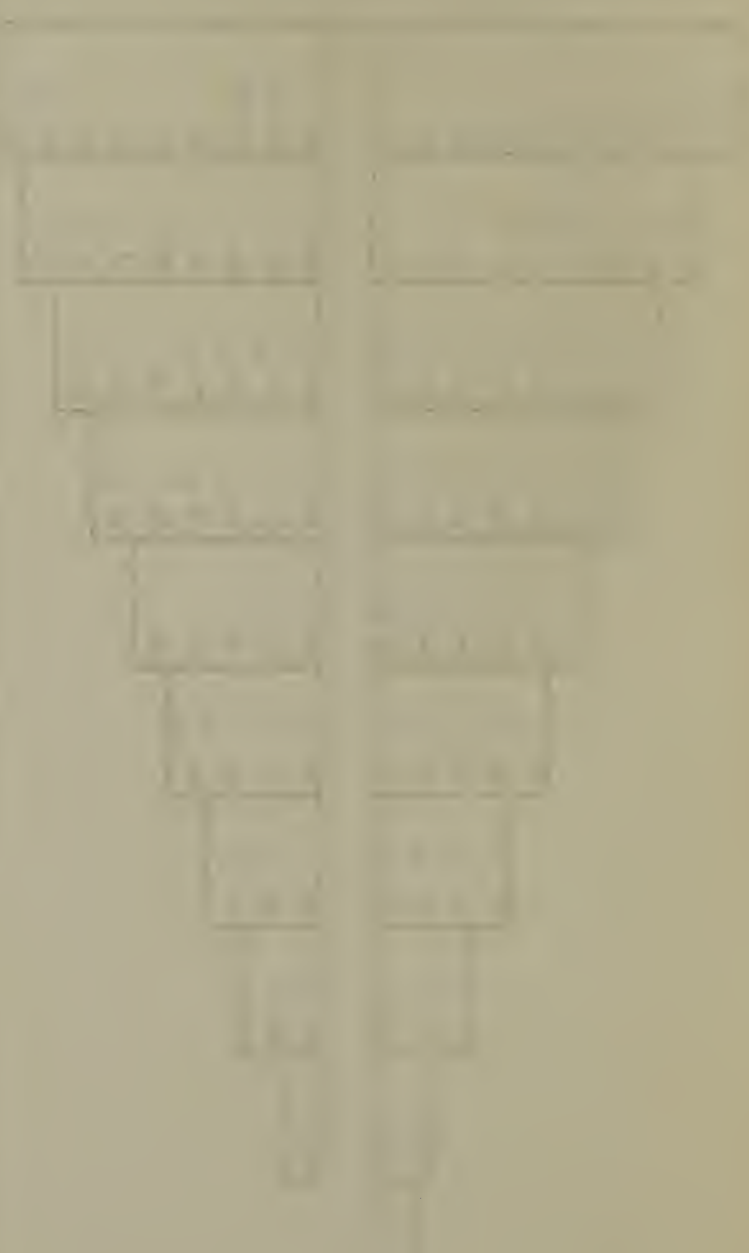
+	0	1	2	3	4	5	6	7	8	9
10	0	1	2	3	4	5				9
11	0	1	2	3			6	7	8	9
12	0	1	2	3	4	5	6	7	8	9
13	0	1	2	3	4	5	6	7	8	9
14	0		2	3	4	5	6	7	8	9
15	0		2	3	4	5	6	7	8	9
16		1	2	3	4	5	6	7	8	9
17		1	2	3	4	5	6	7	8	9
18		1	2	3	4	5	6	7	8	9
19	0	1	2	3	4	5	6	7	8	9
20	0	1	2	3	4	5				9
21	0	1	2	3			6	7	8	9
22	0	1	2	3	4	5	6	7	8	9
23	0	1	2	3	4	5	6	7	8	9
24	0		2	3	4	5	6	7	8	9
25	0		2	3	4	5	6	7	8	9
26		1	2	3	4	5	6	7	8	9
27		1	2	3	4	5	6	7	8	9
28		1	2	3	4	5	6	7	8	9
29	0	1	2	3	4	5	6	7	8	9
30	0	1	2	3	4	5				9
31	0	1	2	3			6	7	8	9
32	0	1	2	3	4	5	6	7	8	9
33	0	1	2	3	4	5	6	7	8	9
34	0		2	3	4	5	6	7	8	9
35	0		2	3	4	5	6	7	8	9
36		1	2	3	4	5	6	7	8	9
37		1	2	3	4	5	6	7	8	9
38		1	2	3	4	5	6	7	8	9
39	0	1	2	3	4	5	6	7	8	9

C

+	1	2	3	4	5	6	7	8
40	X	X	X	X	X			
42	X	X	X	X	X	X		
45		X	X	X	X	X	X	X
48	X	X	X	X	X	X		
49	X	X	X	X	X	X		
54		X	X	X	X	X	X	X
56	X	X	X	X	X	X	X	
63	X	X	X	X	X	X	X	X
64		X	X	X	X	X	X	
72	X	X	X	X	X	X	X	X
81	X	X	X			X	X	X

* New group in red,
Cumulative groups in black.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

TABLE V Section IX

Group IX Wilson

Color for Examples, Black

Color for Problems, Red

A

+	0	1	2	3	4	5	6	7	8	9
0	8	6	4	1	6	7				
1	11	3	6	17			2	6	8	3
2	12	8	7	3	2	7	3	2	1	6
3	4	13	2	3	8	5	2	2	4	1
4	16		4	5	5	2	2	4	4	6
5	10			6	1	5	1		1	1
6		1	4	1	2	2				
7			4	2	6	1	1	6	2	2
8		6	7	2	2	4	1		1	1
9	4	2	3	2	2	3	2	1	2	2

B

+	0	1	2	3	4	5	6	7	8	9
10	1	7	4		4	8				1
11	7	1	1	8	1		4	4	3	3
12	1	1		1	1		2	1	1	
13	1	4	1	1			1	1	1	1
14	3		3	2	1			3	2	
15	2		1			4	1	1	3	1
16										
17				1			2			
18			1	1				2		
19						1				
20		2	1		3	4				1
21	1		1	1				1	1	
22	1	1					1			1
23		1			1					2
24	1								1	

+	0	1	2	3	4	5	6	7	8	9
25	1									1
26										1
27										
28										
29								1		
30		1	1		1	1				
31	1			1						
32	1									
33		1								
34	1									
35	1									
36										
37										
38										
39										

0 1 2 3 4 5 6 7 8 9

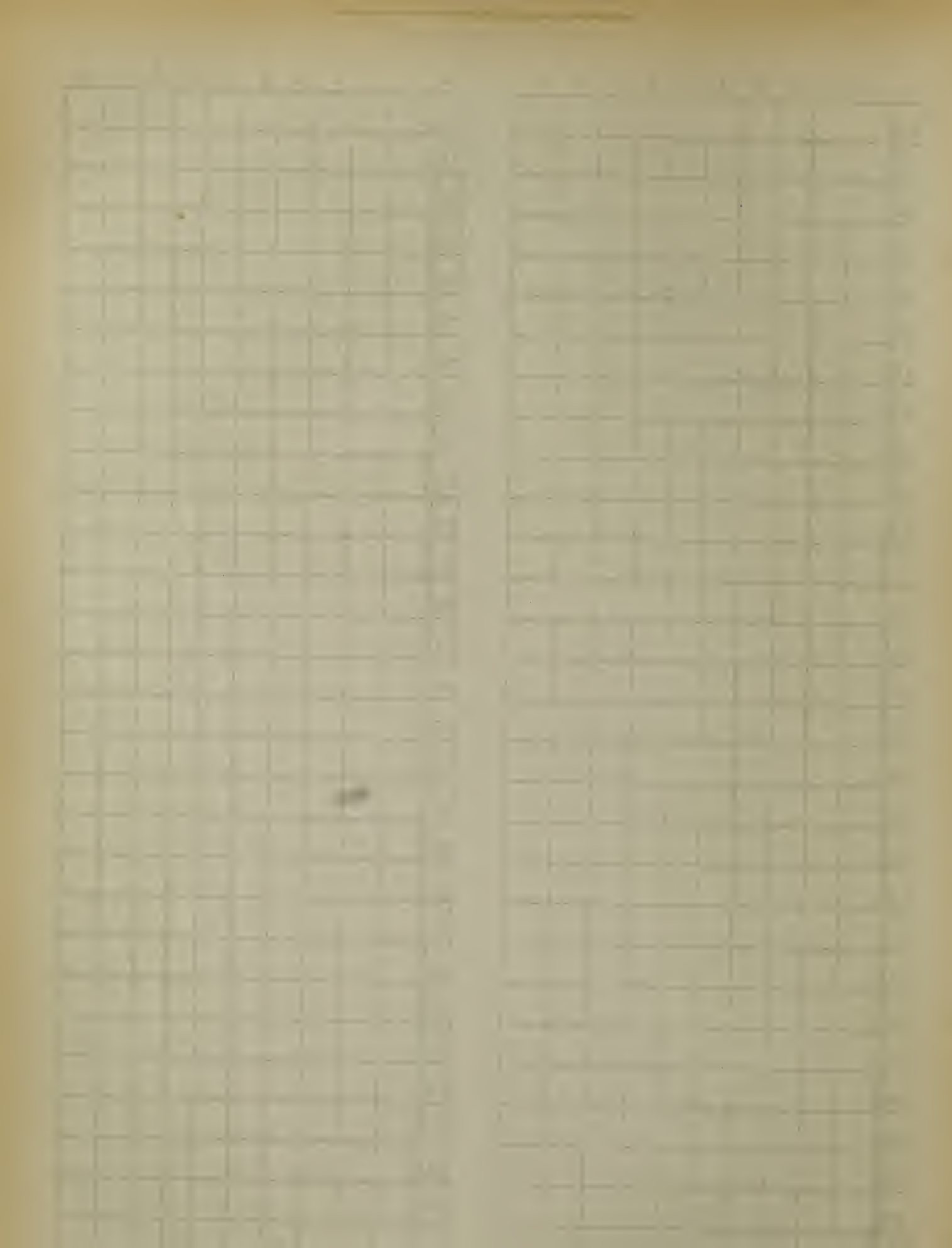
C

+	0	1	2	3	4	5	6	7	8	9
40		1	1		1	1				
42										
45										
48										
49										
54										
56										
63		1								
64										
72										
81				1						

A 10x10 grid of 100 small, dark, irregular shapes, possibly representing a microscopic view of a material or a pattern of small objects. The shapes are dark brown or black, with some appearing more solid and others more fragmented or fibrous. They are distributed across the grid, with some clusters and some empty spaces. The background is a light, off-white or cream color. The overall appearance is that of a microscopic image or a high-magnification photograph of a textured surface.

TABLE VI Section IX
Wilson

[illegible][illegible]



Group X

Group X, in the text, page 28, includes the following primary combinations:

<u>6</u>	<u>1</u>	<u>7</u>	<u>4</u>	<u>8</u>	<u>0</u>	<u>5</u>	<u>0</u>	<u>1</u>	<u>0</u>
<u>0</u>	<u>5</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>6</u>	<u>1</u>	<u>7</u>	<u>4</u>	<u>8</u>

These are shown in red on Table IV, section X, page 123.

The drill work for this group, pages 28 and 29 in the text, is tabulated on Table V-A, B, C, section X, page 124 and on Table VI, , section X, page 125 .

Results of Tabulations of Group X

Table V-A, section X, page 124 shows that:

100 primary facts have been taught,

0 primary facts have been omitted.

Table V-B, section X, page 124 shows that:

300 decade facts have been taught,

0 decade facts have been omitted.

Table V-C, section X, page 124 shows that:

80 higher decade facts have been taught,

0 higher decade facts have been omitted within social and business usage.

Table VI, section X, page 125 shows that:

0 facts beyond social and business usage are taught,

0 facts beyond social and business usage are used.



TEACHING GROUPS

* Group X Wilson

Primary or First Decade Facts

A									
0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0
1	2	3	4	5	6	7	8	9	
1	1	1	1	1	1	1	1	1	1
2	3	4	5	6	7	8	9		
2	2	2	2	2	2	2	2	2	2
3	4	5	6	7	8	9			
3	3	3	3	3	3	3	3	3	3
4	5	6	7	8	9				
4	4	4	4	4	4	4	4	4	4
5	6	7	8	9					
5	5	5	5	5	5	5	5	5	5
6	7	8	9						
6	6	6	6	6	6	6	6	6	6
7	8	9							
7	7	7	7	7	7	7	7	7	7
8	9								
8	8	8	8	8	8	8	8	8	8
9									
9	9	9	9	9	9	9	9	9	9

B										
+	0	1	2	3	4	5	6	7	8	9
10	0	1	2	3	4	5	6	7	8	9
11	0	1	2	3	4	5	6	7	8	9
12	0	1	2	3	4	5	6	7	8	9
13	0	1	2	3	4	5	6	7	8	9
14	0	1	2	3	4	5	6	7	8	9
15	0	1	2	3	4	5	6	7	8	9
16	0	1	2	3	4	5	6	7	8	9
17	0	1	2	3	4	5	6	7	8	9
18	0	1	2	3	4	5	6	7	8	9
19	0	1	2	3	4	5	6	7	8	9
20	0	1	2	3	4	5	6	7	8	9
21	0	1	2	3	4	5	6	7	8	9
22	0	1	2	3	4	5	6	7	8	9
23	0	1	2	3	4	5	6	7	8	9
24	0	1	2	3	4	5	6	7	8	9
25	0	1	2	3	4	5	6	7	8	9
26	0	1	2	3	4	5	6	7	8	9
27	0	1	2	3	4	5	6	7	8	9
28	0	1	2	3	4	5	6	7	8	9
29	0	1	2	3	4	5	6	7	8	9
30	0	1	2	3	4	5	6	7	8	9
31	0	1	2	3	4	5	6	7	8	9
32	0	1	2	3	4	5	6	7	8	9
33	0	1	2	3	4	5	6	7	8	9
34	0	1	2	3	4	5	6	7	8	9
35	0	1	2	3	4	5	6	7	8	9
36	0	1	2	3	4	5	6	7	8	9
37	0	1	2	3	4	5	6	7	8	9
38	0	1	2	3	4	5	6	7	8	9
39	0	1	2	3	4	5	6	7	8	9

C								
+	1	2	3	4	5	6	7	8
40	X	X	X	X	X	X	X	
42	X	X	X	X	X	X		
45	X	X	X	X	X	X	X	X
48	X	X	X	X	X	X	X	
49	X	X	X	X	X	X		
54	X	X	X	X	X	X	X	X
56	X	X	X	X	X	X	X	
63	X	X	X	X	X	X	X	X
64	X	X	X	X	X	X	X	
72	X	X	X	X	X	X	X	X
81	X	X	X	X	X	X	X	X

* New group in red,
Cumulative groups in black.

TABLE V Section X

Group X Wilson

Color for Examples, Black

Color for Problems, Red

A

+	0	1	2	3	4	5	6	7	8	9
0	2			3	1		8	7	3	1
1	4	3	5	5	20	9	1	5	2	3
2	2	3	6	6	5		2	6	3	6
3	1	7	8	4	9	2	1	4	2	3
4	3	20	7	6	2	5	2			
5	3	25	7	7	3	2	4	3	3	2
6	23	6	8	3	2	1	3	3	3	2
7	19	10	5		3	5			1	2
8	19	8	3	5	4	1	2		1	3
9	3	1	1	1	2	3	1	3	1	

B

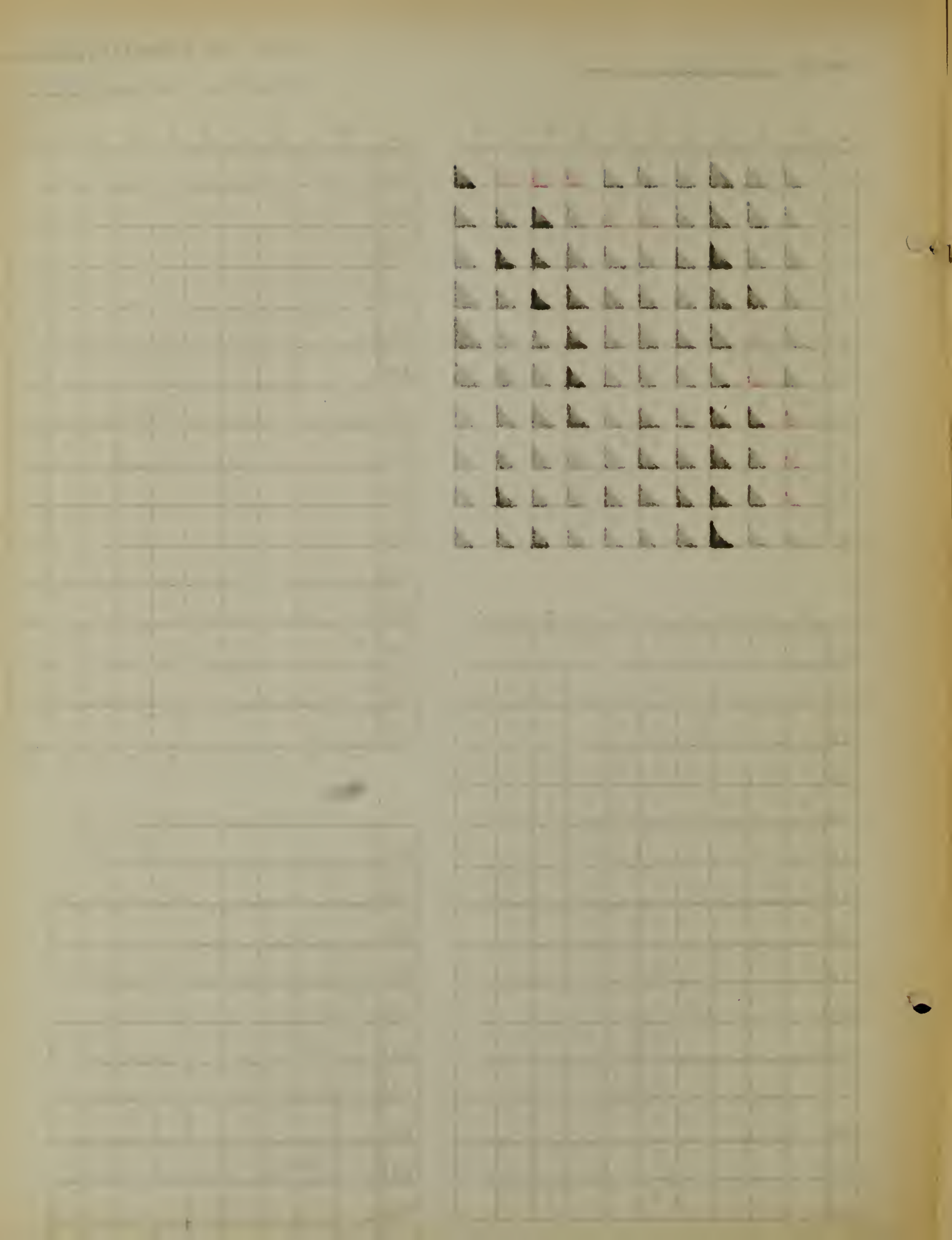
+	0	1	2	3	4	5	6	7	8	9
10	4		1	3	2	6	3	4	2	
11	1		1		6	4	5	4	2	1
12			2	4	4	1			2	3
13	2	1		1	1	2		3	1	1
14	2	2	2		1	1	2	1	1	1
15	5	1	5			1	1	3		
16	5	2	1	2	1				3	2
17	2				3	3	2		1	
18	2	1	1		1	1	1			
19				2			1			
20	1				1		2	2	1	1
21					2	1		2	1	
22		1	1	1	1				2	
23					2				1	1
24		1		1	2			2		

+	0	1	2	3	4	5	6	7	8	9
25	1	1						1		
26	1					1		1		
27	1						1			
28	1			1		1			1	
29			1		1					
30							1	1	1	
31					1	1				
32		1								
33										
34		1								
35		1								
36	1									
37	1									
38	1									
39										

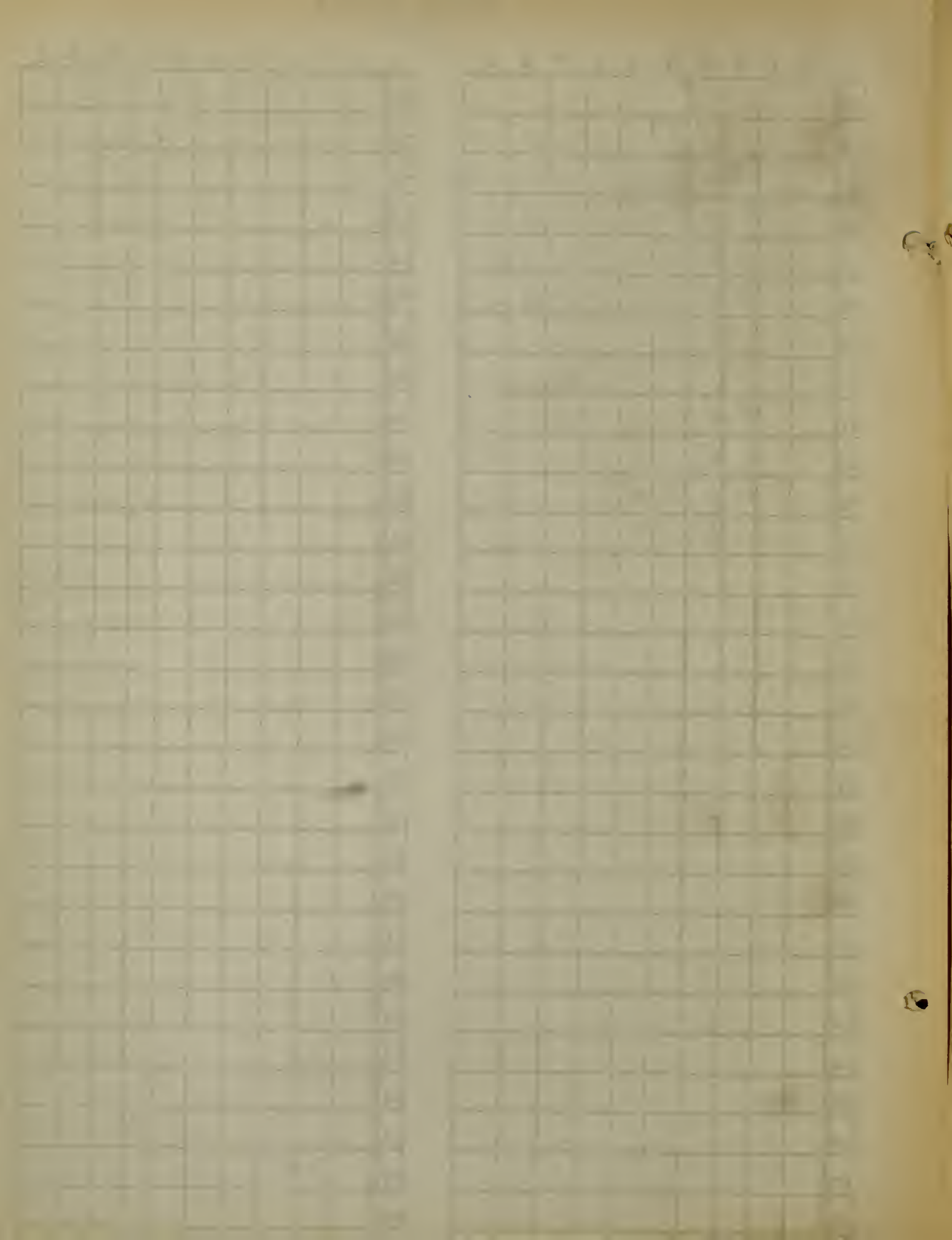
0 1 2 3 4 5 6 7 8 9

C

40							1	1		
42										
45		1								
48										
49										
54		1								
56										
63										
64		1								
72										
81						1	1			



[illegible][illegible]



SUMMARY

The summary table on page 127 shows the following:

Table A:

100 primary facts up to $9 + 9$ have been taught.

100 primary facts up to $9 + 9$ have been used.

The drill work in the primary facts is quite evenly distributed.

Table B:

200 secondary facts up to $39 + 9$ have been taught.

200 primary facts up to $39 + 9$ have been used.

Table C:

80 secondary facts beyond $39 + 9$ needed in multiplication have been taught.

80 secondary facts beyond $39 + 9$ needed in multiplication have been used.

The facts shown in this table are used in carrying in multiplication.

The summary table on page 128 shows the following:

0 secondary facts beyond social usage have been taught.

0 secondary facts beyond social usage have been used.

The drill facts have been taken up in ten teaching steps. In every case the facts have not been used until after they have been taught.

TEACHING GROUPS

SUMMARY TABLE

* Group Wilson

B

Primary or First Decade Facts

A

0 1 2 3 4 5 6 7 8 9	0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9
2 3 4 5 6 7 8 9	2 2 2 2 2 2 2 2
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9
3 4 5 6 7 8 9	3 3 3 3 3 3 3 3
3 3 3 3 3 3 3 3	4 5 6 7 8 9
4 5 6 7 8 9	4 4 4 4 4 4 4 4
4 4 4 4 4 4 4 4	5 6 7 8 9
5 6 7 8 9	5 5 5 5 5 5 5 5
5 5 5 5 5 5 5 5	6 7 8 9
6 7 8 9	6 6 6 6 6 6 6 6
6 6 6 6 6 6 6 6	7 8 9
7 8 9	7 7 7 7 7 7 7 7
7 7 7 7 7 7 7 7	8 9
8 9	8 8 8 8 8 8 8 8
8 8 8 8 8 8 8 8	9
9	9 9 9 9 9 9 9 9
9 9 9 9 9 9 9 9	

+	0	1	2	3	4	5	6	7	8	9
10	0	1	2	3	4	5	6	7	8	9
11	0	1	2	3	4	5	6	7	8	9
12	0	1	2	3	4	5	6	7	8	9
13	0	1	2	3	4	5	6	7	8	9
14	0	1	2	3	4	5	6	7	8	9
15	0	1	2	3	4	5	6	7	8	9
16	0	1	2	3	4	5	6	7	8	9
17	0	1	2	3	4	5	6	7	8	9
18	0	1	2	3	4	5	6	7	8	9
19	0	1	2	3	4	5	6	7	8	9
20	0	1	2	3	4	5	6	7	8	9
21	0	1	2	3	4	5	6	7	8	9
22	0	1	2	3	4	5	6	7	8	9
23	0	1	2	3	4	5	6	7	8	9
24	0	1	2	3	4	5	6	7	8	9
25	0	1	2	3	4	5	6	7	8	9
26	0	1	2	3	4	5	6	7	8	9
27	0	1	2	3	4	5	6	7	8	9
28	0	1	2	3	4	5	6	7	8	9
29	0	1	2	3	4	5	6	7	8	9
30	0	1	2	3	4	5	6	7	8	9
31	0	1	2	3	4	5	6	7	8	9
32	0	1	2	3	4	5	6	7	8	9
33	0	1	2	3	4	5	6	7	8	9
34	0	1	2	3	4	5	6	7	8	9
35	0	1	2	3	4	5	6	7	8	9
36	0	1	2	3	4	5	6	7	8	9
37	0	1	2	3	4	5	6	7	8	9
38	0	1	2	3	4	5	6	7	8	9
39	0	1	2	3	4	5	6	7	8	9

C

+	1	2	3	4	5	6	7	8
40	X	X	X	X	X	X	X	
42	X	X	X	X	X	X		
45	X	X	X	X	X	X	X	X
48	X	X	X	X	X	X		
49	X	X	X	X	X	X		
54	X	X	X	X	X	X	X	X
56	X	X	X	X	X	X	X	
63	X	X	X	X	X	X	X	X
64	X	X	X	X	X	X	X	
72	X	X	X	X	X	X	X	X
81	X	X	X	X	X	X	X	X

* New group in red,
Cumulative groups in black.

TABLE V Section XI

Group Summary Wilson

Color for Examples, Black
Color for Problems, Red

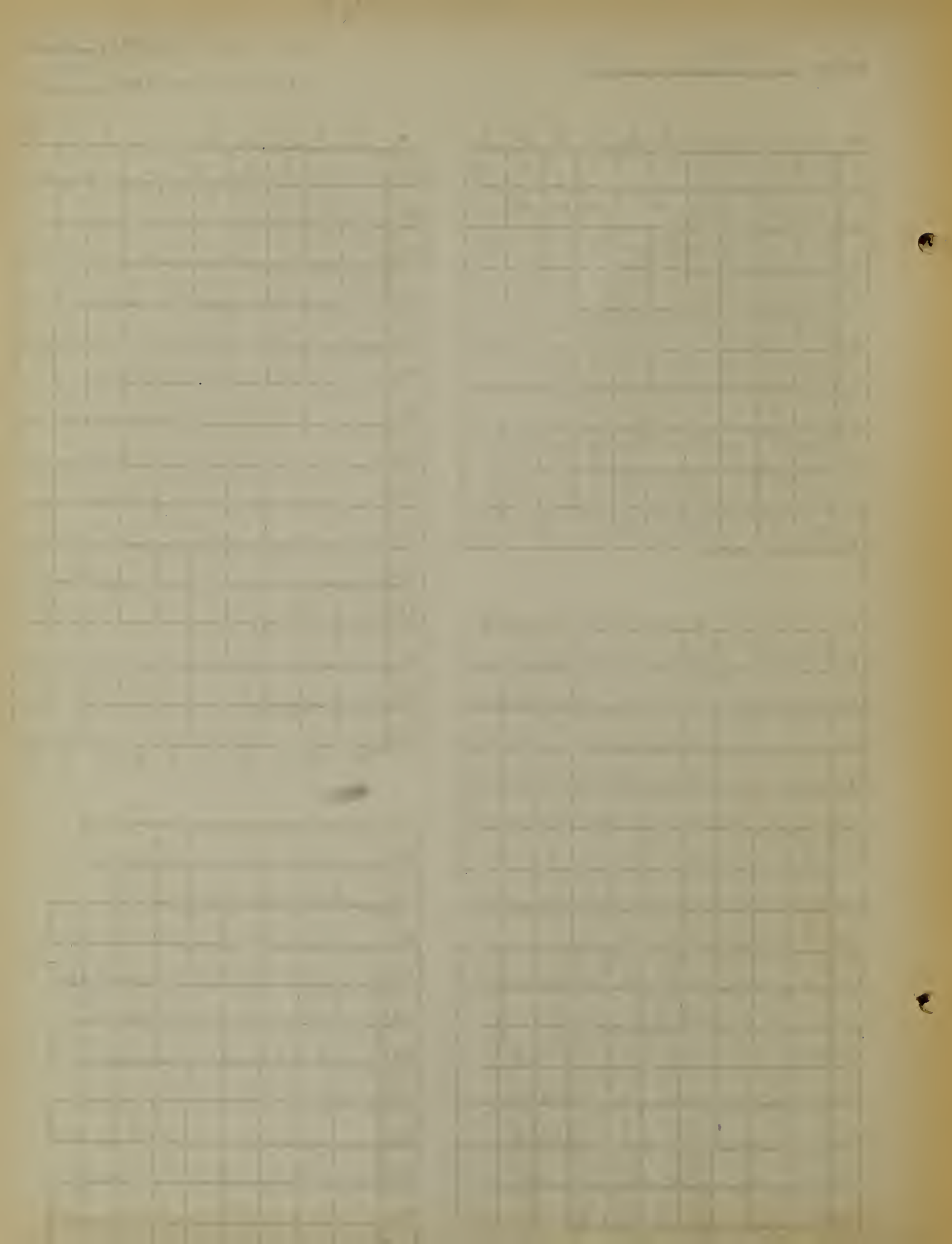
A

+	0	1	2	3	4	5	6	7	8	9
0	69	6	4	36	7	7	8	7	3	23
1	15	166	23	22	20	9	52	29	25	21
2	14	38	101	120	63	59	52	42	36	34
3	79	20	65	69	54	43	45	34	22	13
4	19	20	29	33	31	55	21	10	13	25
5	13	25	42	35	112	30	12	16	17	8
6	23	36	67	51	16	12	17	22	22	11
7	19	36	64	18	16	32	34	33	29	31
8	19	31	49	12	21	26	31	27	19	22
9	43	19	18	84	62	26	19	25	14	41

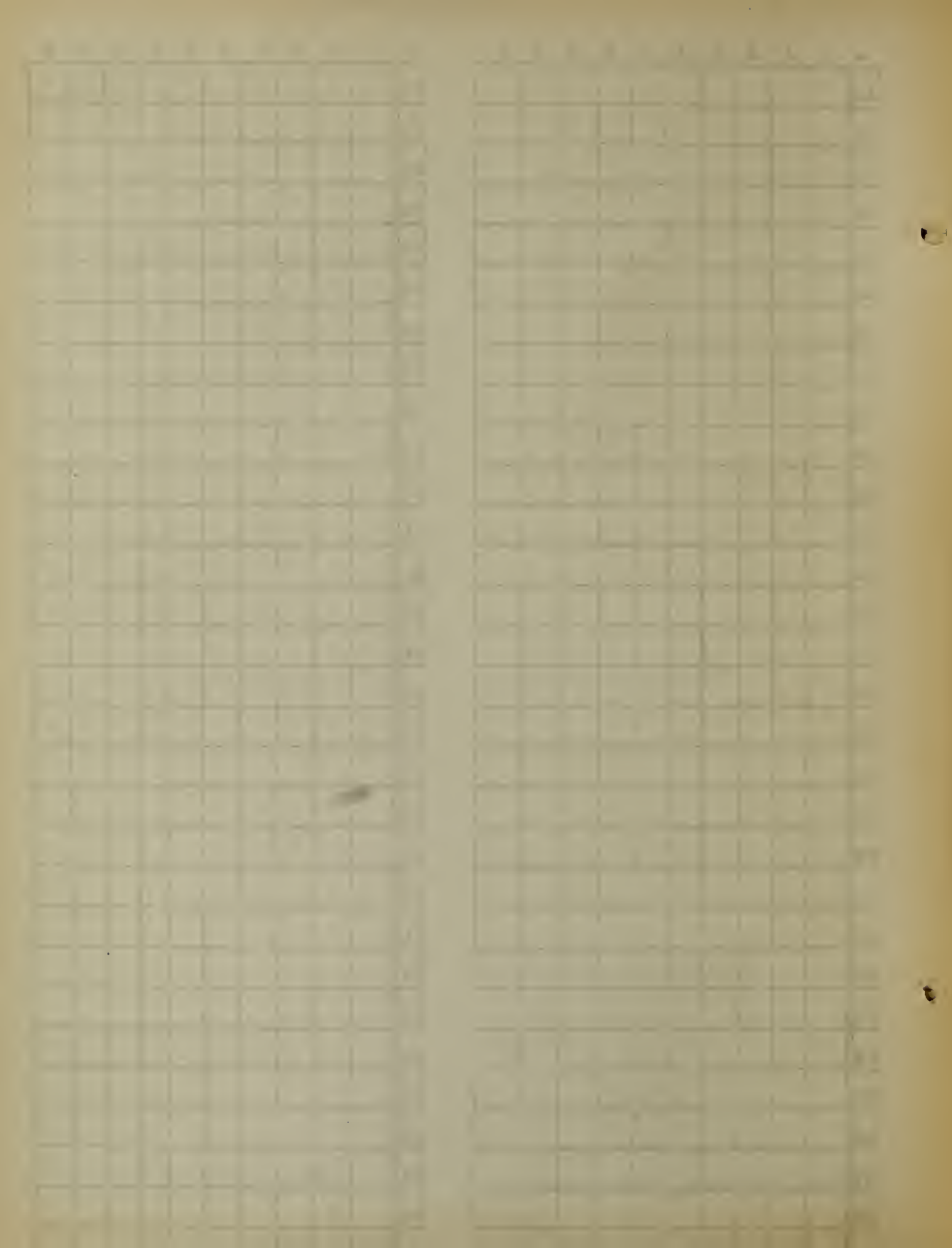
+	0	1	2	3	4	5	6	7	8	9
10	77	7	5	75	6	14	3	4	2	19
11	8	6	17	8	7	4	18	23	15	20
12	1	4	36	24	12	11	9	17	11	21
13	24	5	21	37	12	33	24	23	8	18
14	5	2	17	11	13	11	16	15	10	10
15	7	1	13	11	7	25	9	7	7	4
16	5	10	8	8	8	7	15	8	11	6
17	2	8	1	15	3	11	5	6	4	3
18	2	2	9	2	14	5	10	17	9	5
19	2	2	3	12	16	7	6	7	1	8
20	18	2	1	21	4	4	2	2	1	11
21	1	1	8	1	2	1	2	15	6	7
22	1	3	2	5	3	4	6	14	6	8
23	6	1	1	4	5	12	7	4	3	9
24	1	1	1	3	4	3	3	2	5	4

+	0	1	2	3	4	5	6	7	8	9
25	2	1	4	2	1	11	4	2	1	1
26	1	2	2	1	1	3	4	4	1	3
27	1	1	1	3	1	2	4	2	1	2
28	1	1	2	1	2	2	9	2	3	5
29	1	2	2	2	4	2	3	5	1	3
30	15	1	1	7	1	1	1	1	1	2
31	1	3	1	1	1	1	2	6	1	1
32	1	1	1	3	2	1	2	1	1	1
33	1	1	1	2	1	1	1	2	1	3
34	1	1	1	1	1	4	1	1	1	1
35	1	1	2	1	1	1	1	1	2	1
36	1	2	1	1	2	1	1	1	1	1
37	1	1	1	1	1	1	1	1	1	1
38	1	1	1	1	2	1	1	1	1	1
39	1	1	1	1	1	1	1	1	1	1

+	0	1	2	3	4	5	6	7	8	9
40		1	1	1	1	1	1	1		
42		1	1	1	1	1	1			
45		1	1	1	1	1	1	1	2	
48		1	1	1	1	1	1	1		
49		1	1	1	1	1	1			
54		1	1	1	1	1	1	1	1	
56		1	1	1	1	1	1	1		
63		1	1	1	1	1	1	1	1	
64		1	1	1	1	1	1	1		
72		1	1	1	1	1	1	1	2	
81		1	1	1	1	1	1	2	1	



[illegible][illegible]



PART THREE

THE FOLLOWING ANALYSIS COVERS THE ADDITION

DRILL IN

STRAYER-UPTON ARITHMETIC

BOOK I

PUBLISHED BY

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38 Lexington Ave., N.Y.

1928

Analysis of the Addition in the Strayer-Upton

Arithmetic

Book I

Purpose

This Analysis is for the purpose of finding out the following:

1. The teaching groups.
2. The number of combinations taught and their frequency.
3. Whether the facts taught precede their occurrence in examples.
4. The process steps taught.
5. Whether the process steps taught precede their occurrence in examples.

Explanation of Method.

Three different tables are used for each teaching group.

Table VII shows the teaching group.

Table VIII shows:

1. The frequency of these combinations in drill examples and problems for this group.
2. The combinations, if any, that have preceded group teaching.
3. The combinations, if any, that have been studied and have not been included in drill work.

In this table the combinations are tabulated in three groups:

- A. The 100 primary combinations,
- B. The 300 decade combinations up to $39 + 9$,
- C. The 80 combinations needed for carrying in multiplication.

Table IX shows the combinations, if any, beyond the limits of those needed for social and business usage, namely, those from 40 plus 1 to 9, to 99 plus 1 to 9 with the exception of those needed for carrying in multiplication, which have been already recorded in Table II.

Pages 1 to 7 inclusive contains counting, games, exercises, etc., used as introductory work to show the pupil the uses of number and a need for knowing combinations and processes. Since the work is introductory to the teaching group, Table VII, section O is omitted. The combinations used are recorded in Table VIII, section O page 133, the primary group "A" which are read from left to top as: $\begin{matrix} 0 & 0 & 2 \\ 0 & 3 & 1 \end{matrix}$: the decade in group "B" are read in the same manner. The number in each square indicates the frequency of use of the combination represented by that square. The black figures indicate the combinations used in examples and the red figures indicate the combinations used in problems.

The first part of the paper discusses the importance of the study of the history of the United States. It is argued that a knowledge of the past is essential for a full understanding of the present. The author then goes on to discuss the various factors which have shaped the development of the United States, including the influence of the British, the Spanish, and the French. He also discusses the role of the American people in the creation of the new nation. The paper concludes by stating that the study of the history of the United States is a task of great importance, and that it is one which should be undertaken by all who are interested in the future of the country.

TABLE VIII Section 0

Group Introductory Strayer-Upton

Pages 2, 3, 4, 5, 6, 7.

A

Color for Examples, Black

Color for Problems, Red

+	0	1	2	3	4	5	6	7	8	9
0	2			1						
1									1	1
2		1		1	1	2	2	2	1	
3		1	2		3	1	2	2		
4	1	2	1	1	1	1	3			
5	1		3	1	3	3				
6	1		1	1	1					
7		1	1	2						
8			1							
9		2								

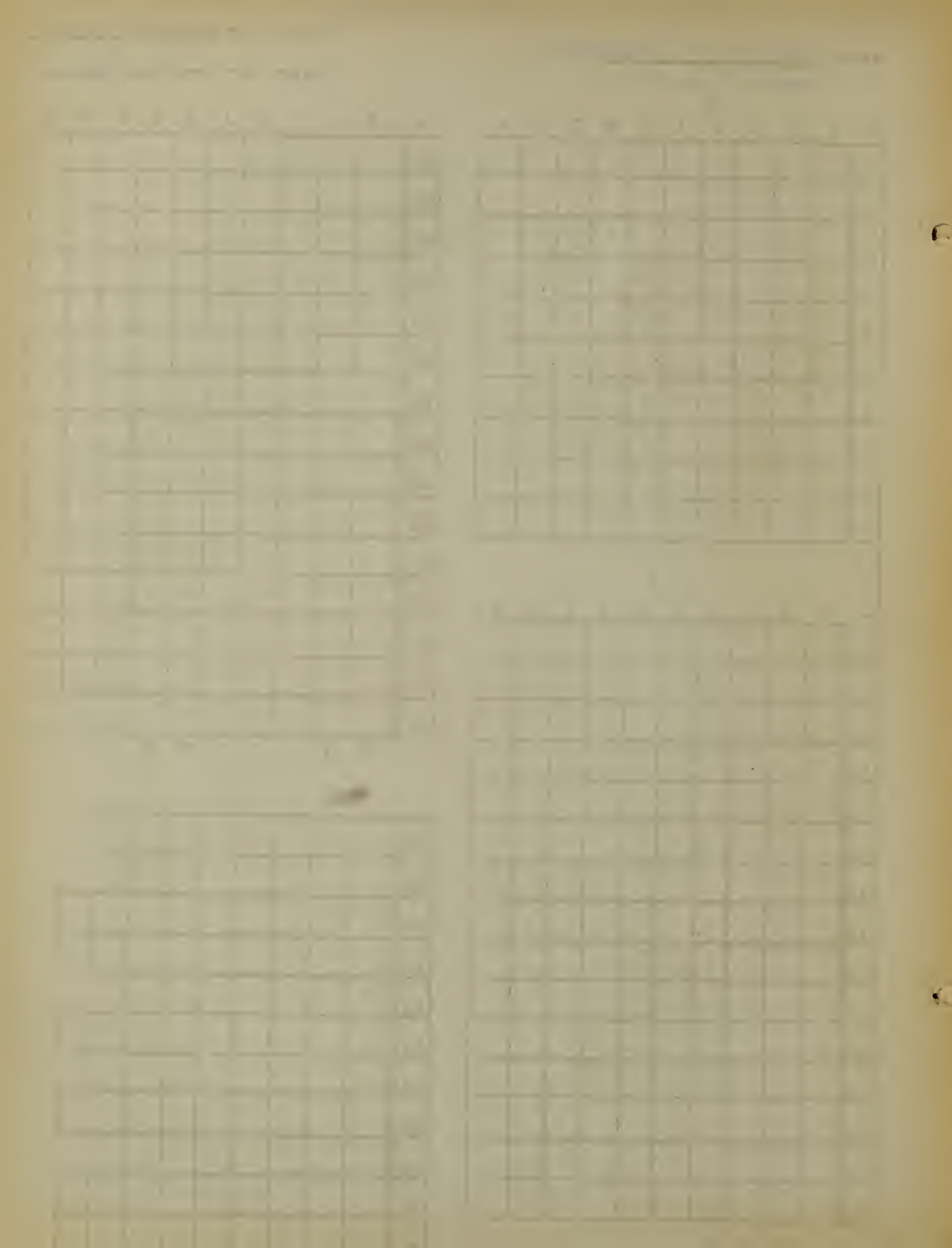
B

[illegible][illegible]

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

C

40							
42							
45							
48							
49							
54							
56							
63							
64							
72							
81							



Group I, page 8 in the text, includes the primary combinations which have a sum of 10:

4	8	1	6	1	4	5	0	1	0	1	2	7	2	3	0	2	9	3	8	1	0	3
<u>2</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>5</u>	<u>8</u>	<u>4</u>	<u>3</u>	<u>8</u>	<u>3</u>	<u>0</u>	<u>7</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>5</u>	<u>1</u>	<u>2</u>	<u>4</u>	<u>1</u>
6	0	5	1	5	7	5	4	3	1	8	3	3	0	1	2	0	6	2	0	1	0	3
<u>4</u>	<u>2</u>	<u>0</u>	<u>6</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>3</u>	<u>0</u>	<u>7</u>	<u>0</u>	<u>3</u>	<u>6</u>	<u>5</u>	<u>5</u>	<u>4</u>	<u>6</u>	<u>0</u>	<u>5</u>	<u>1</u>	<u>9</u>	<u>7</u>	<u>7</u>
4	3	7	2	2	0	5	4	7	6	1	9	6	4	2	2	4	5					
<u>6</u>	<u>4</u>	<u>3</u>	<u>0</u>	<u>6</u>	<u>9</u>	<u>3</u>	<u>5</u>	<u>2</u>	<u>3</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>8</u>	<u>2</u>	<u>4</u>	<u>4</u>					

These are shown in red in Table VII-A. They are read from the bottom up as 2 + 4; 2 + 8; 1 + 1. (Page 135)

The drill work for this group which is found in the arithmetic, pages 8, 9, & 19, is tabulated in Table VIII, section I, page 136. The red triangles placed in the squares indicate the combinations included in this teaching group. That is, they are the combinations shown in Table VII, section I, page 135. They are the only combinations which should be used since they are the only ones which have been taught.

Results of Tabulations of Group I

Table VIII-A, section I, page 136 shows that:

64 primary facts have been taught

0 primary facts have been used which have not been taught,

16 primary facts have been taught which have not been used in the drill.

Table VIII-B, section I, page 136 and Table VIII-C, section I, page 136 show that:

0 decade facts have been taught

0 decade facts have been used

Table IX, section I, page 137 shows that:

0 higher decade facts have been taught

0 higher decade facts have been used.

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EDITED BY
ALFRED C. HADFIELD, F.R.S.
AND
H. H. SELLERS, F.R.S.

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TEACHING GROUPS

* Group I Strayer-Upton

Primary or First Decade Facts

A

0 1 2 3 4 5 6 7 8 9	0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9	0 0 0 0 0 0 0 0 0
1 1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9
2 3 4 5 6 7 8	2 2 2 2 2 2
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9
3 4 5 6 7	3 3 3 3
3 3 3 3 3 3 3 3	4 5 6 7 8 9
4 5 6	4 4
4 4 4 4 4 4 4	5 6 7 8 9
5	6 7 8 9
5 5 5 5 5	7 8 9
6 6 6 6	8 9
7 7 7	9
8 8	
9	

B

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.

TABLE VIII Section I

Group I Strayer-Upton

Pages 8, 9, 19

A

Color for Examples, Black

Color for Problems, Red

	0	1	2	3	4	5	6	7	8	9
0	8									
1	3	1	1	1	1	3	1	2	1	1
2	2	2	3		1		3	1		
3		2	2	2		2	1			
4	1	4		2	2	1	2			
5	1	2		1	1	2				
6		4	1	2	2					
7	1	3	1	2						
8	1	3	3							
9		2								

B

[illegible][illegible]

0 1 2 3 4 5 6 7 8 9

C

40							
42							
45							
48							
49							
54							
56							
63							
64							
72							
81							

Table with 10 columns and 10 rows. The content is mostly blank or contains very faint, illegible text.

Table with 10 columns and 10 rows. The content is mostly blank or contains very faint, illegible text.

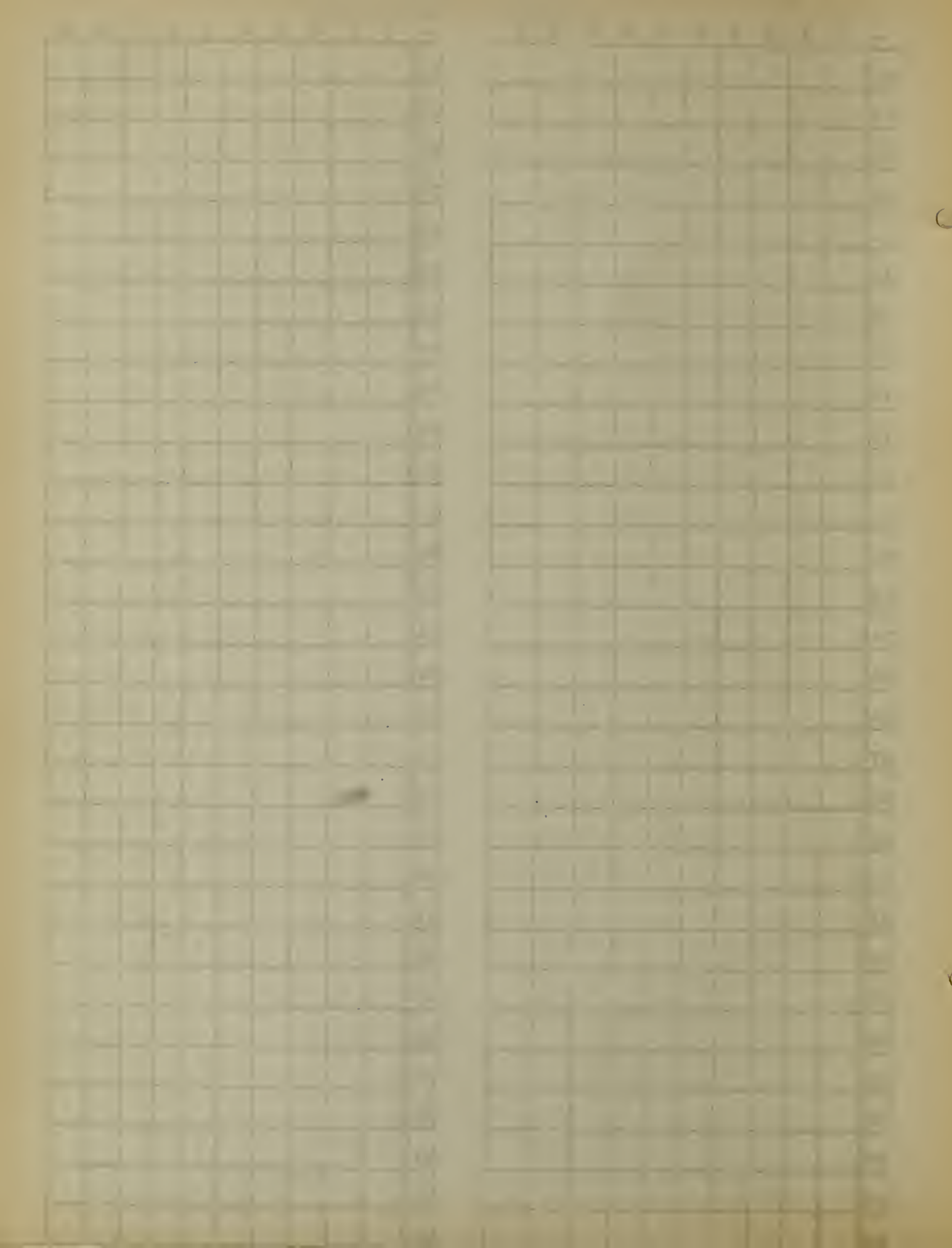
Table with 10 columns and 10 rows. The content is mostly blank or contains very faint, illegible text.

Table with 10 columns and 10 rows. The content is mostly blank or contains very faint, illegible text.

Group I

Strayer-Upton

[illegible][illegible]



[illegible][illegible]



Group II, Strayer-Upton Arithmetic, page 25 includes the following combinations:

9	2	8	3	9	3	7	4	8	4	9	4	6	5	7	5	8	5
<u>2</u>	<u>9</u>	<u>3</u>	<u>8</u>	<u>3</u>	<u>9</u>	<u>4</u>	<u>7</u>	<u>4</u>	<u>8</u>	<u>4</u>	<u>9</u>	<u>5</u>	<u>6</u>	<u>5</u>	<u>7</u>	<u>5</u>	<u>8</u>

These are shown in red, Table VII-A, section II, page 140. The first teaching group is also shown in this table but tabulated in black.

The drill work for this group, Strayer-Upton Arithmetic pages 25 and 26, is tabulated in Table VIII-A, B, C, section II page 141. The combinations in Table VIII-C, section II, indicate those needed in carrying in multiplication beyond $39+9$. The combinations beyond $39+9$ with the exception of those needed for carrying in multiplication are tabulated in Table IX, section II, page 142. The black triangles in Table II, section II indicate the combinations previously taught.

Results of Tabulations of Group II

Table VIII-A, section II, page 141 shows that:

82 primary facts have been taught,

1 primary fact has been used which has not been taught,

2 new primary facts have not been used in the drill work.

Table VIII-B, section II, page 141 shows that:

0 decade facts have been taught,

1 decade fact has been used which has not been taught

Table IX, section II, page 142 shows that:

0 decade combinations beyond $39 + 9$ are taught,

0 decade combinations beyond $39 + 9$ are used.

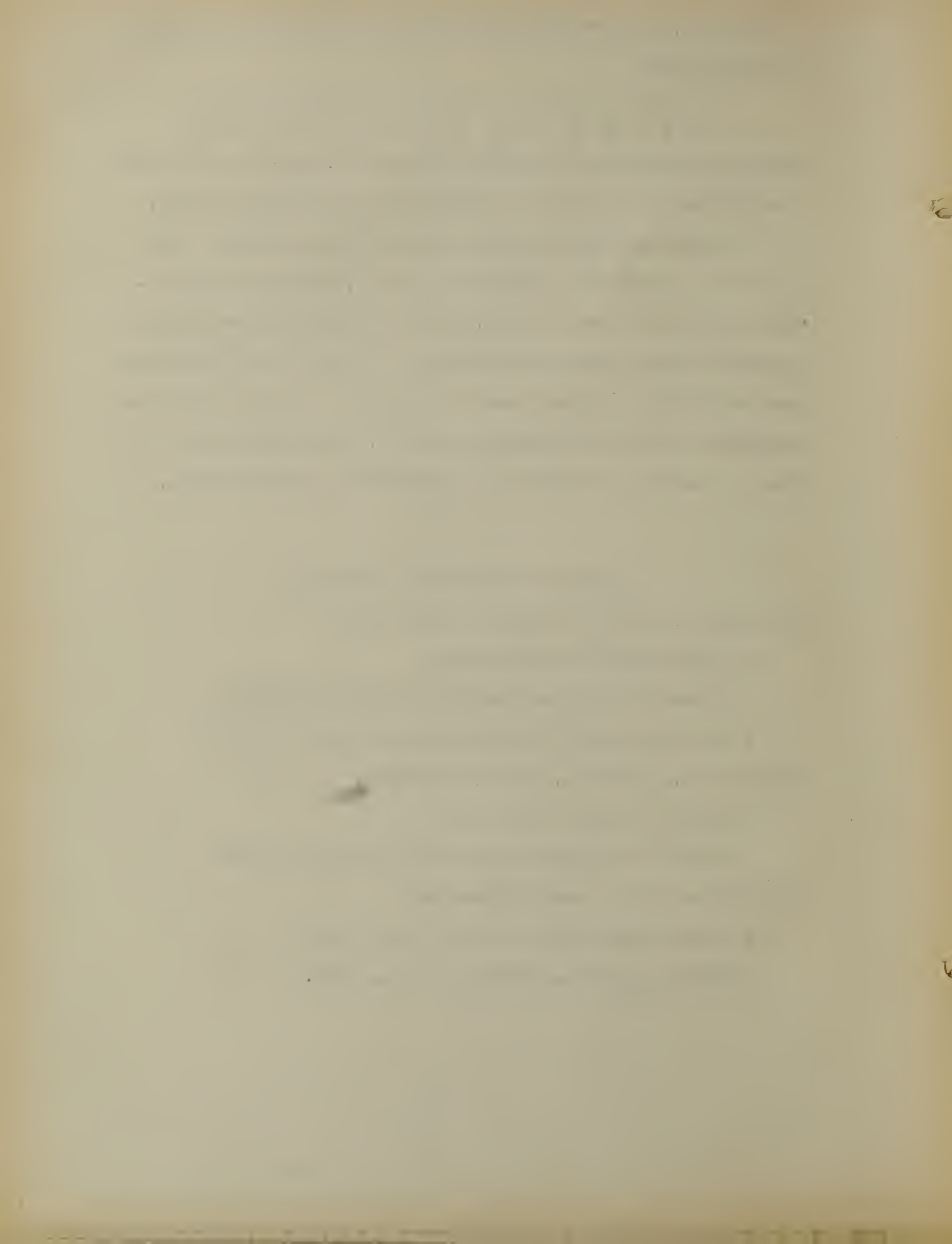


TABLE VII Section II

TEACHING GROUPS

* Group II Strayer-Upton

B

Primary or First Decade Facts

A

1 2 3 4 5 6 7 8 9	0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9
2 3 4 5 6 7 8 9	2 2 2 2 2 2 2
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9
3 4 5 6 7 8 9	3 3 3 3 3 3 3
3 3 3 3 3 3 3 3	4 5 6 7 8 9
4 5 6 7 8 9	4 4 4 4 4
4 4 4 4 4 4 4	5 6 7 8 9
5 6 7 8	5 5 5 5
5 5 5 5 5 5	6 7 8 9
6 6 6 6	7 8 9
7 7 7	8 9
8 8	9
9	

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
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25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.

TABLE VIII Section II

Group II Strayer-Upton

Pages 25 , 26

Color for Examples, Black

Color for Problems, Red

	0	1	2	3	4	5	6	7	8	9
0										
1	1			1	1	1			1	
2				1	1	2				1
3			1	1	1	1			2	
4		1		1	2	1	1		1	
5			1	2	1	1	1	1	1	
6				1	1	2				
7				2	5	3				
8	1			2	4	3				
9			2	3	3	1				

+	0	1	2	3	4	5	6	7	8	9
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
	0	1	2	3	4	5	6	7	8	9

C

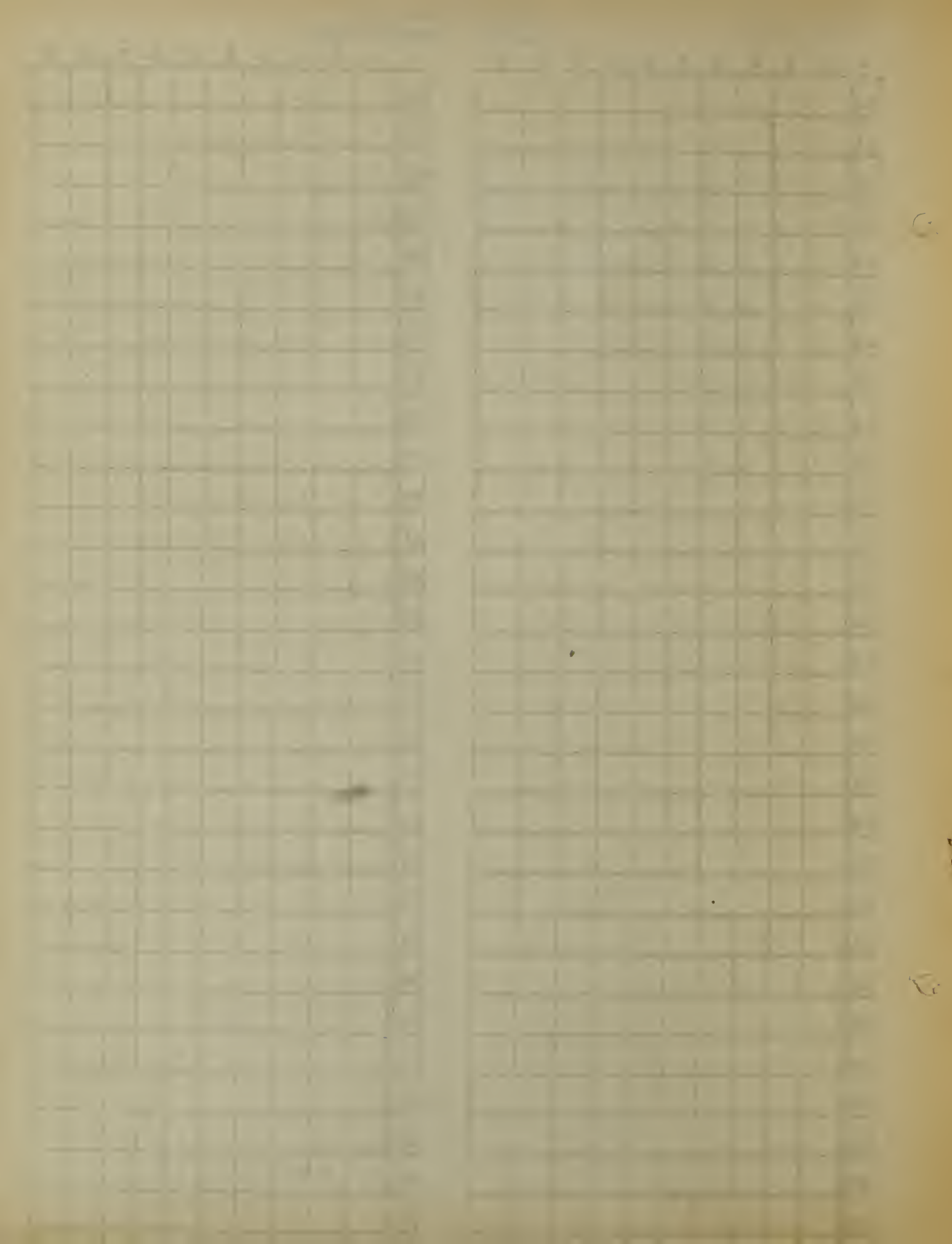
[illegible]

40							
42							
45							
48							
49							
54							
56							
63							
64							
72							
81							

A 10x10 grid of small, dark, irregular shapes, possibly representing a pattern or a collection of small objects. The shapes are mostly dark brown or black, with some lighter, reddish-brown ones interspersed, particularly in the lower half of the grid. The grid is set against a light beige background.

TABLE IX Section II
Group II Strayer-Upton

[illegible]



Group III and Drill

Group III, Strayer-Upton Arithmetic, page 27 in the text, includes the following combinations:

9	5	6	7	6	8	6	9	6	7	8	7	9	7	9	8	8	9
<u>5</u>	<u>9</u>	<u>6</u>	<u>6</u>	<u>7</u>	<u>6</u>	<u>8</u>	<u>6</u>	<u>9</u>	<u>7</u>	<u>7</u>	<u>8</u>	<u>7</u>	<u>9</u>	<u>8</u>	<u>9</u>	<u>8</u>	<u>9</u>

These are shown in red, Table VIII-A, section III, page 147. The preceding groups are shown in black. Table VII, is cumulative always showing every combination which has been taught.

The drill work for this group, Strayer-Upton Arithmetic covers many pages. It is therefore necessary to divide the work up into six parts. Table I will be omitted from now on as the author has finished his teaching groups.

PART I

Results of Tabulation of Group III

Table VIII-A, section III, page 148 shows that:

100 primary facts have been taught,

2 new primary facts have not been used in the drill

Table VIII-B, section III, page 148 shows that:

0 decade facts have been taught

58 decade facts have been used

Table VIII-C, section III, page 148 shows that:

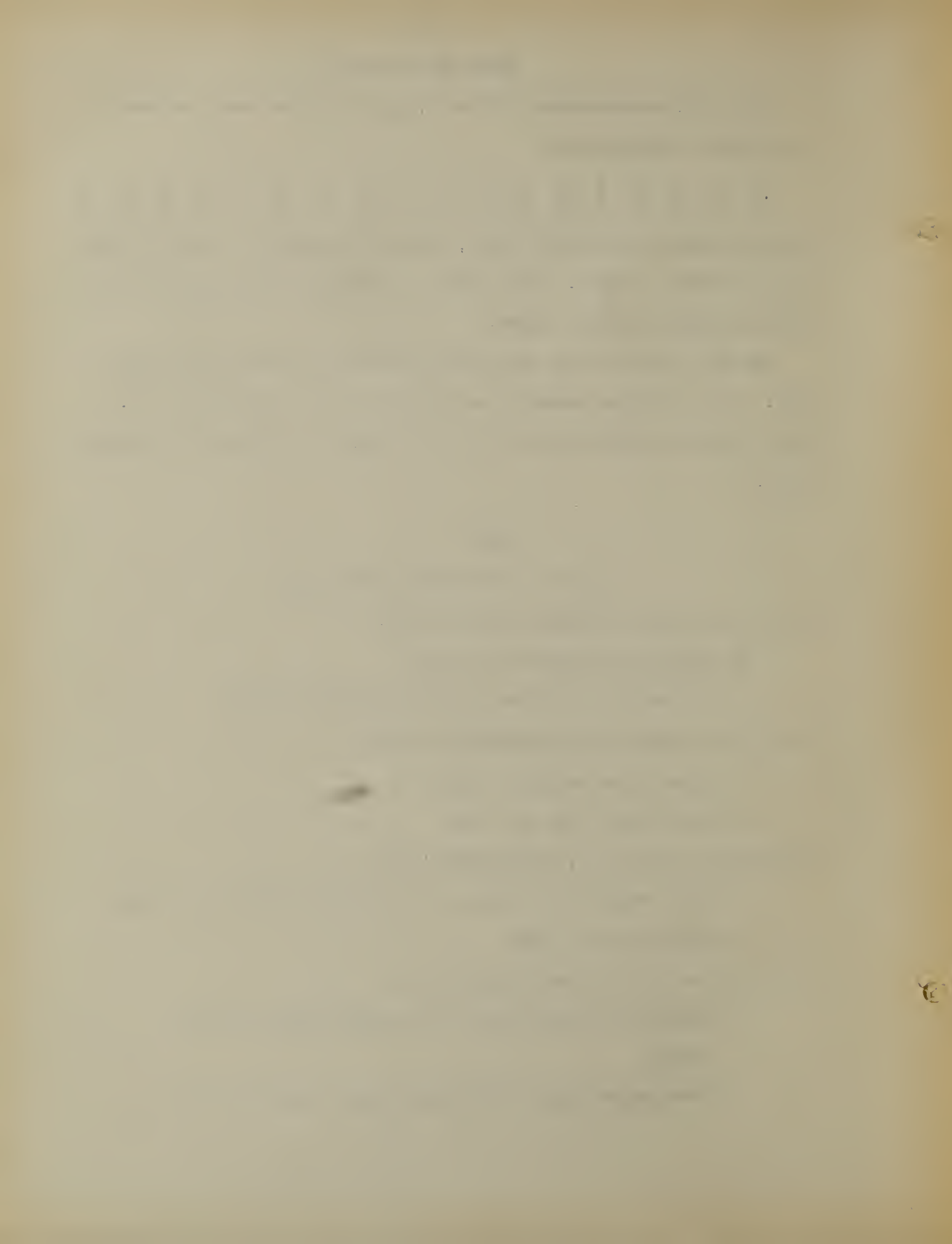
0 facts needed for carrying in multiplication have been taught,

0 facts have been used

Table VIII, section III, page 148 shows that:

0 combinations beyond social and business usage have been taught,

0 combinations beyond social and business usage are used.



Group III and Drill

PART II

Strayer-Upton Arithmetic, pages 48, 49, 50, 51, 52, 53, 55.

Table VIII-A, section IV, page 150 shows that:

0 drill on the following combinations:

0+1, 0+2, 0+3, 0+5, 0+6, 0+7, 0+8, 0+9, 1+0, 4+0,

Table VIII-B, section IV, page 150 shows that:

145 decade combinations have been used in spite of the fact that
the author has failed to teach any decade facts.

Table IX, section IV, page 151 shows that:

0 higher decade combinations beyond business and social usage
have been used.

PART III

Strayer-Upton Arithmetic, pages 56, 57, 58, 59, 60, 61, 62.

Table VIII-A, section V, page 150 shows that:

0 drill on the following combinations:

0+1, 0+2, 0+4, 0+9, 2+0,

Table VIII-B, section V, page 150 shows that:

47 decade combinations have been used although the author has
failed to teach any decade combinations.

Table IX, section V, page 151 shows that:

0 decade facts beyond 39+9 have been used.

Group III and Drill

PART IV

Strayer-Upton Arithmetic, pages 116, 122, 123, 124, 125, 155.

Table VIII-A, section VI, page 153 shows that:

0 drill on the following combinations:

0+0, 0+2, 0+3, 2+0, 8+0, 9+0.

Table VIII-B, section VI, page 153 shows that:

153 decade combinations are used.

Table VIII-C, section VI, page 153 shows that:

44 higher decade combinations, needed in carrying in multiplication, are used.

Table IX, section VI, page 154 shows that:

174 higher decade combinations beyond social and business usage are used.

PART V

Strayer-Upton Arithmetic, pages 173, 177, 178, 179, 182.

Table VIII-A, section VII, page 155 shows that:

0 drill on the following combinations:

0+0, 0+1, 0+2, 0+3, 0+5, 0+7, 0+8, 3+7, 4+0, 6+0, 8+0.

Table VIII-B, section VII, page 155 shows that:

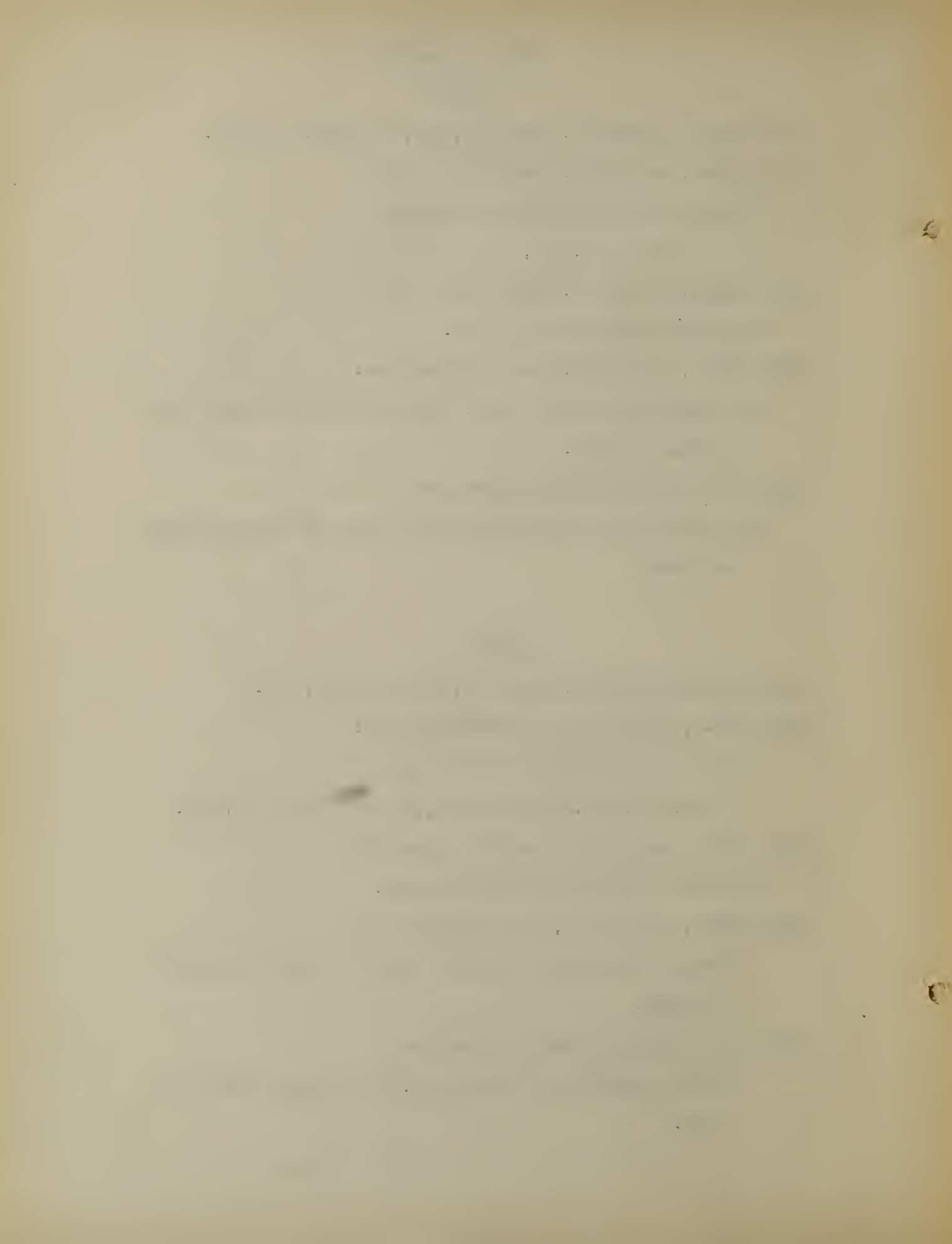
150 decade combinations have been used.

Table VIII-C, section VII, page 155 shows that:

8 decade combinations needed in carrying in multiplication are used.

Table IX, section VII, page 156 shows that:

15 decade combinations beyond social and business usage are used.



Group III and Drill

PART VI

Strayer-Upton Arithmetic, pages 218, 240, 242, 247, 248.

Table VIII-A, section VIII, page 157 shows that:

0 drill on the following combinations:

0+0, 0+1, 0+6, 0+7, 0+8, 6+0.

Table VIII-B, section VIII, page 157 shows that:

183 decade combinations have been used.

Table VIII-C, section VIII, page 157 shows that:

20 higher decade combinations needed in carrying in multiplication, are used.

Table IX, section VIII, page 158 shows that:

54 higher decade combinations beyond social and business usage are used.

TABLE VII Section III

TEACHING GROUPS

B

* Group III Strayer-Upton

Primary or First Decade Facts

A

0 1 2 3 4 5 6 7 8 9	0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0	1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9	1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1	2 3 4 5 6 7 8 9
2 3 4 5 6 7 8 9	2 2 2 2 2 2 2
2 2 2 2 2 2 2 2	3 4 5 6 7 8 9
3 4 5 6 7 8 9	3 3 3 3 3 3
3 3 3 3 3 3 3	4 5 6 7 8 9
4 5 6 7 8 9	4 4 4 4 4
4 4 4 4 4 4	5 6 7 8 9
5 6 7 8 9	5 5 5 5
5 5 5 5 5	6 7 8 9
6 7 8 9	6 6 6
6 6 6 6	7 8 9
7 8 9	7 7
7 7 7	8 9
8 8	8
8 8	9
9	

+	0	1	2	3	4	5	6	7	8	9
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
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27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

C

+	1	2	3	4	5	6	7	8
40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

* New group in red,
Cumulative groups in black.

TABLE VIII Section III
Part I

Group III Part I Strayer-Upton

Pages 27, 29, 33, 34, 35, 36, 37, 39, 40, 44,
45, 46. A

Color for Examples, Black

Color for Problems, Red

	0	1	2	3	4	5	6	7	8	9
0	1	1				1			1	
1		23	14	16	3	1	4	3	3	5
2	1	3	2	2	3	1	4	4	6	9
3		4	2	2	3	3	2	3	4	8
4			2	1	4	4	6	6	4	8
5			3	5	4	7	5	2	3	2
6		2	2	4	3	2		2	7	4
7	1	4	3	1		2	2	5	2	3
8		4	2			1	1	3	1	1
9	3	1		1	1	1	2	2	2	3

+	0	1	2	3	4	5	6	7	8	9
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
	0	1	2	3	4	5	6	7	8	9

[illegible]

40								
42								
45								
48								
49								
54								
56								
63								
64								
72								
81								

[illegible][illegible]

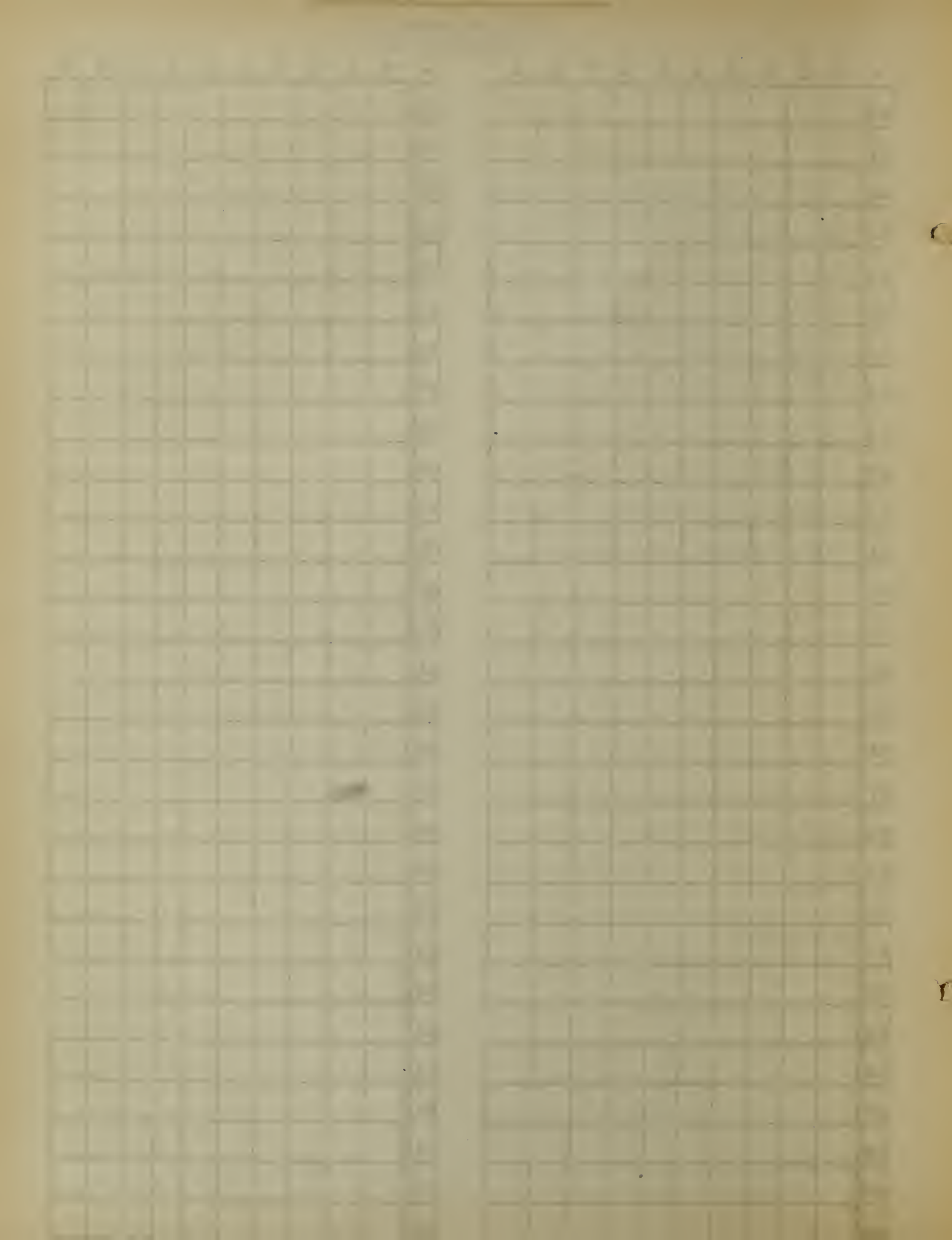


TABLE VIII Section IV

Group III Strayer-Upton

PART II

Color for Examples, Black

Pages 48, 49, 50, 51, 52, 53, 55.

Color for Problems, Red

A

+	0	1	2	3	4	5	6	7	8	9
0										
1		10	16	12	14	13	10	10	5	13
2	1	16	16	3	5	4	5	2	2	2
3	3	1	2	1						
4		6	6	4	6	8	7	6	7	6
5	1	6	10	4	3	3	8	4	5	4
6	1	6	12	4	7	4	7	7	4	8
7	1	8	9	4	4	8	6	9	12	8
8	4	11	2	2	7	9	8	5	6	11
9	2	2	3	7	7	6	4	5	8	8

B

+	0	1	2	3	4	5	6	7	8	9
10		1	2	4	2	3	5	6	6	5
11	1	1	1	1	1	4	4	2	1	2
12	2	1	2	1	2	5	5	1	4	7
13		3		1	3	4	3	5	3	2
14	1	1	3	2	2	2	4	4	3	4
15		1	1	2	1	1	1	1	1	2
16	1	1	2	4	5	3	1	2	2	
17		1	1	1	4	2	5	3	5	3
18		2		2	2	2	2	3	1	1
19		1	2	2	1	3	1	2		3
20		1	1	1	1	2	1	1	1	1
21		1	1	1	1	1	1	1	1	1
22		1	1	1	1	1	1	1	1	1
23		1	1	1	1	1	1	1	1	3
24		1	1	1	1	1	1	1	1	1

+	0	1	2	3	4	5	6	7	8	9
25		1	1	1	1	1	1	1	1	1
26		1	1	1	1	1	1	1	1	1
27		1	1	1	1	1	1	1	1	1
28		1	1	1	1	1	1	1	1	1
29		1	1	1	1	1	1	1	1	1
30										
31										
32										
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C

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TABLE IX Section IV
Strayer- Upton

[illegible][illegible]

Color for Examples, Black

Color for Problems, Red

						C
40						
42						
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64						
72						
81						

Color for Examples, Black

Color for Problems, Red

	0	1	2	3	4	5	6	7	8	9
0		1			1	1	2	5	2	2
1	2	6	9	12	6	13	9	10	11	8
2		1	5	6	3	8	9	5	4	11
3	1	1	5	3	9	5	13	2	7	3
4	1	7	1	1	8	2	4	8	2	2
5	1 ²	3	5	4	3	1	5	8	4	13
6	2	1	1	6	2	6	2	9	4	6
7	2	6	3	7	5	12	4	2	7	7
8		1	11	6	6	4	8	14	9	7
9		4	7	7	6	9	9	7	6	7

	0	1	2	3	4	5	6	7	8	9
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11	2	2	7	3	6	5	8	8	3	4
12	3	4	4	4	5	4	4	4	3	7
13		5	4	3	6	4	4	3	4	5
14	2	5	3	3	8	6	5	3	3	6
15	1	4	5	4	4	7	3	4	5	6
16	3	4	2	3	6	5	4	4	5	6
17	1	6	4	4	5	9	7	5	4	7
18	3	4	1	6	4	4	3	4	5	7
19	4		7	2	4	5	3	3	5	2
20	2	1	1	3	3	5	1	5	1	7
21		1	2	4	4	3	4	3	2	8
22	1	2	7		5	6	2	3	5	1
23		1	2	6	3	4	6	7	3	3
24	2	3	5	4	2	3	3	1	1	2

+	0	1	2	3	4	5	6	7	8	9
25		2	3	4	4	3	3	2	3	2
26	1	1	2	1	2	2	3	2	5	2
27		2	2	6		1	3	2	4	2
28		1		3	2	1		3		1
29	2	2		1	2		1	1	3	1
30	1	1	1				1	1	5	
31		1		1			1			2
32		2	1	3	1	1	2	2	2	1
33		2	1	3	2	1	3	1	1	3
34					1	1	1	1	1	
35	3						1	3		
36	1								1	
37		1	1	1	1	2	1	2	1	2
38	1	1	1	3	1	1	1	1	2	1
39	1	1	1	2	1	1	1	1	1	1
	0	1	2	3	4	5	6	7	8	9

40								
42		2	1	1	1	1	1	
45		1	1	1	1	1	1	1
48		1	1	1	1	1	1	
49								
54		1	1	1	1	1	1	1
56		1	1	1	1	1	1	
63								
64		1	1	1	1	1	1	
72								
81								

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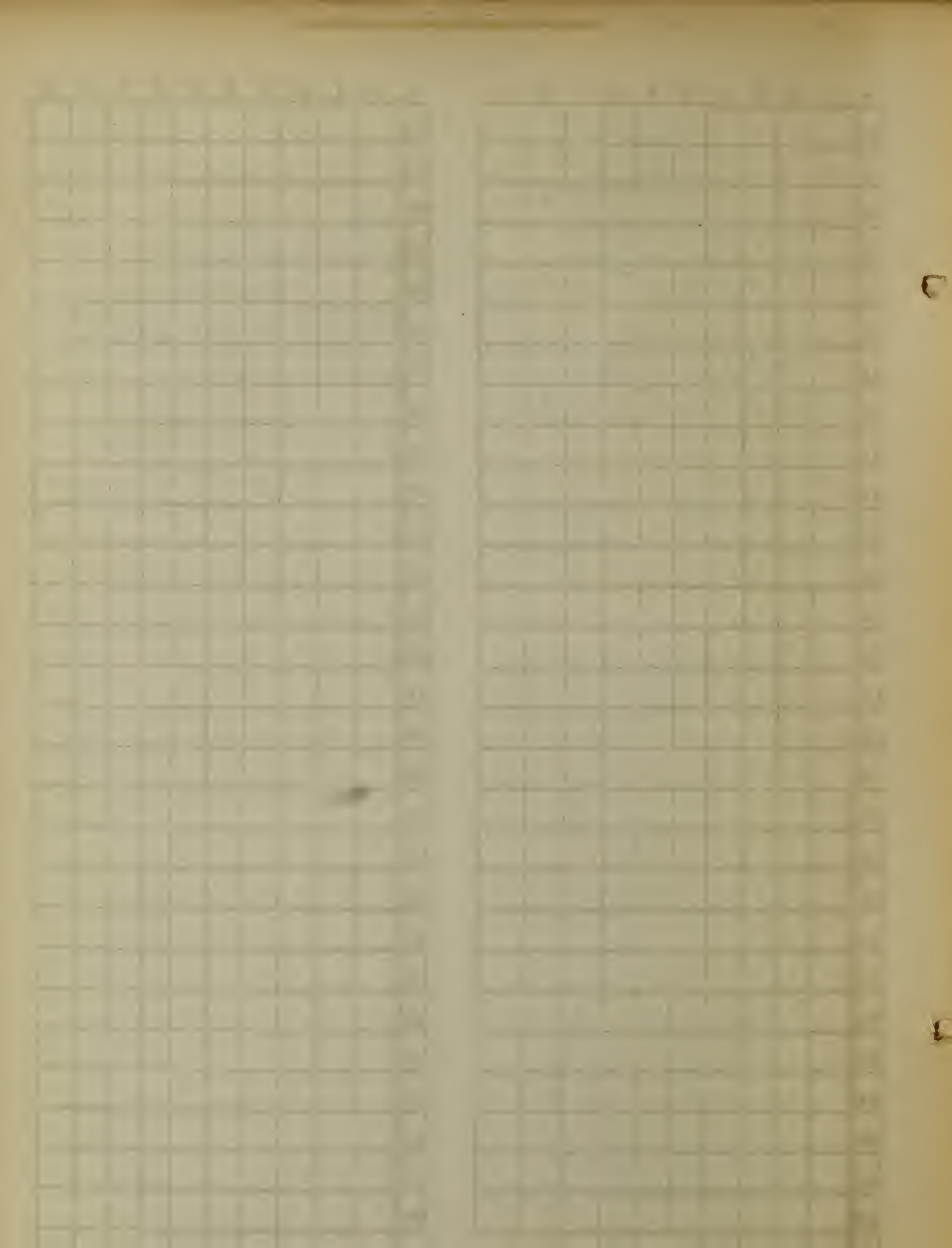


TABLE VIII Section VII
Strayer-Upton

Group

III Part V

Pages 173, 177, 178, 179, 182

A

+	0	1	2	3	4	5	6	7	8	9
0					1		1			1
1	3		3	7	6	4	6	3	1	1
2	1	4	5	6	8	6	8	2	1	6
3	3	4	5	6	6	2	6		6	3
4		4	3	4	4	3	5	3	5	7
5	3	2	1		3	2	7	2	5	4
6		2	3	3	3	6	1	9	4	7
7	4	6	2	2	5	1	7	4	6	7
8		5	6	5	4	5	3	4	3	4
9	1	2	3	3	3	9	5	10	5	5

B

+	0	1	2	3	4	5	6	7	8	9
10	2	1	2	2		3	1	4	4	3
11	4	2	3	4	3	5	7	5	6	3
12	1	2	1	2	2	6	1	4	3	
13	2	2	5	3	4	7	3	5	4	4
14	1	2	2	4	1	5	2	2	5	5
15	1	4	1	3	3	5	2	8	2	3
16	3	3	6	5	5	3	2	2	4	4
17	5	4	3	8	3	1	8	7	1	1
18	2	2	1	3	2	6	7	4	5	6
19	3	2	3	4	5	1	4	1	5	6
20	6	4	3	3	2	3	3	3		5
21	4	4	2	3	3	2	4			1
22	5	4	2	3	3		4	1	5	2
23	5	4	1	1	5	2	3	5	2	4
24	2	3	5	3	3	1	1	4	1	4

Color for Examples, Black
Color for Problems, Red

+	0	1	2	3	4	5	6	7	8	9
25	2	4	5	1	2	2	2	1	3	
26	2	1	2	1	5	1	4	4		1
27	3	5	1		2	2	5	5	4	1
28	2	1	2	1	4		1	1	2	3
29	2	2	1	1		1	1	1	1	2
30	2	1	1	2	2	3	2		2	1
31	1	4	1	1			1		1	2
32	1	3	3	1	2		2		2	1
33	1	1	1	1		2	1	2	4	1
34					2	1		1	1	1
35			1			2	2			2
36			1		1	1	1	1	3	1
37			1	1		2				
38	1			1	1	1				
39				2					1	

C

40		1	1	2		1	
42		1				1	
45				2			
48						1	
49							
54							
56							
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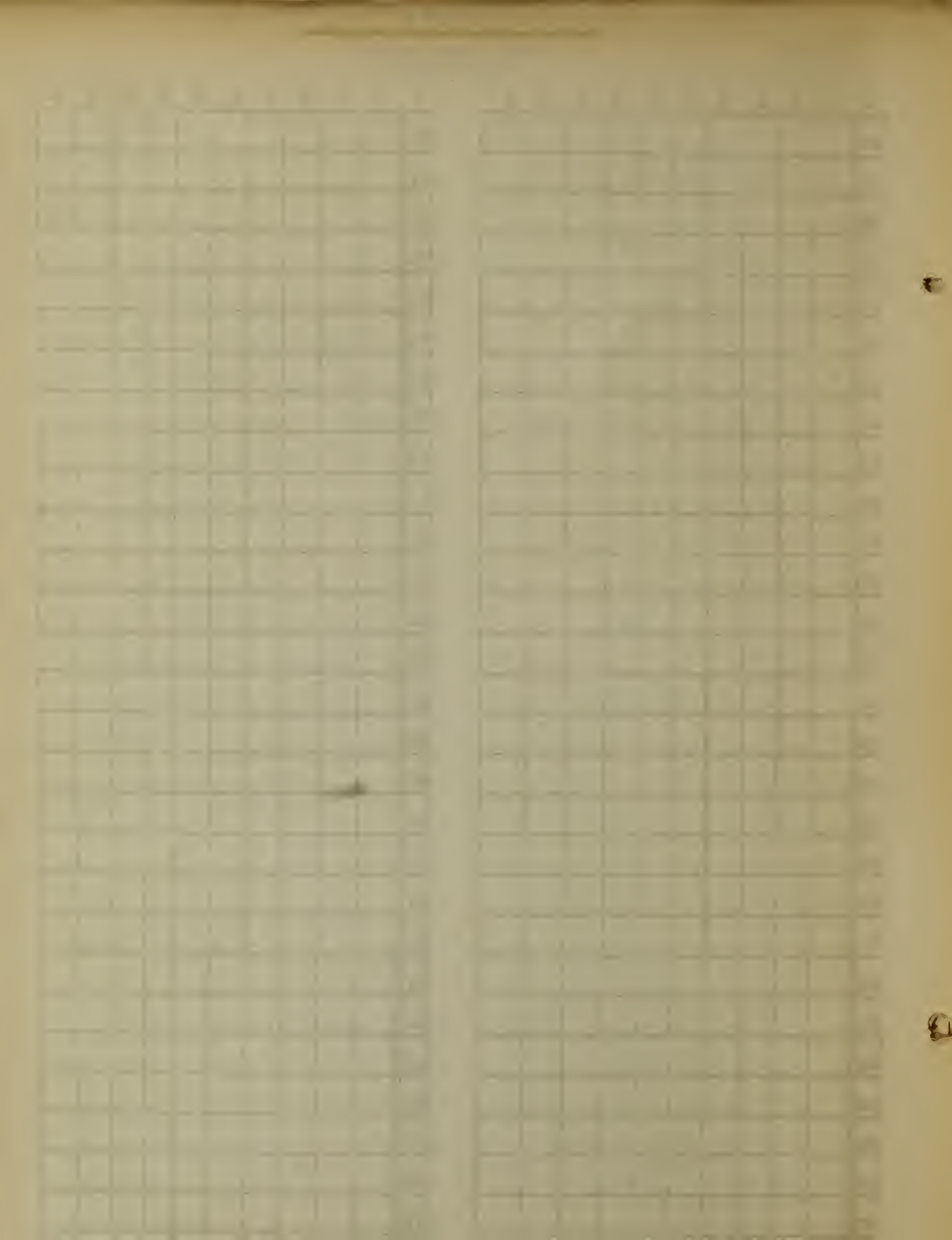


TABLE VIII Section VIII
Strayer-Upton

Group III Part VI

Pages 218, 240, 242, 247, 248.

Color for Examples, Black
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+	0	1	2	3	4	5	6	7	8	9
0			1	2	1	1				3
1	16	4	10	2	4	5	2	9	3	10
2	1	4	3	1	8	5	11	6	6	8
3	6	8	12	15	11	11	11	9	11	6
4	3	4	7	5	5	6	6	9	7	6
5	3	3	3	1	4	3	8	5	1	6
6		6	7	2	6	4	4	7	12	10
7	4	3	10	7	7	5	5	3	6	5
8	1	3	7	13	8	6	1	12	6	6
9	9	6	7	7	6	7	4	6	10	9

B

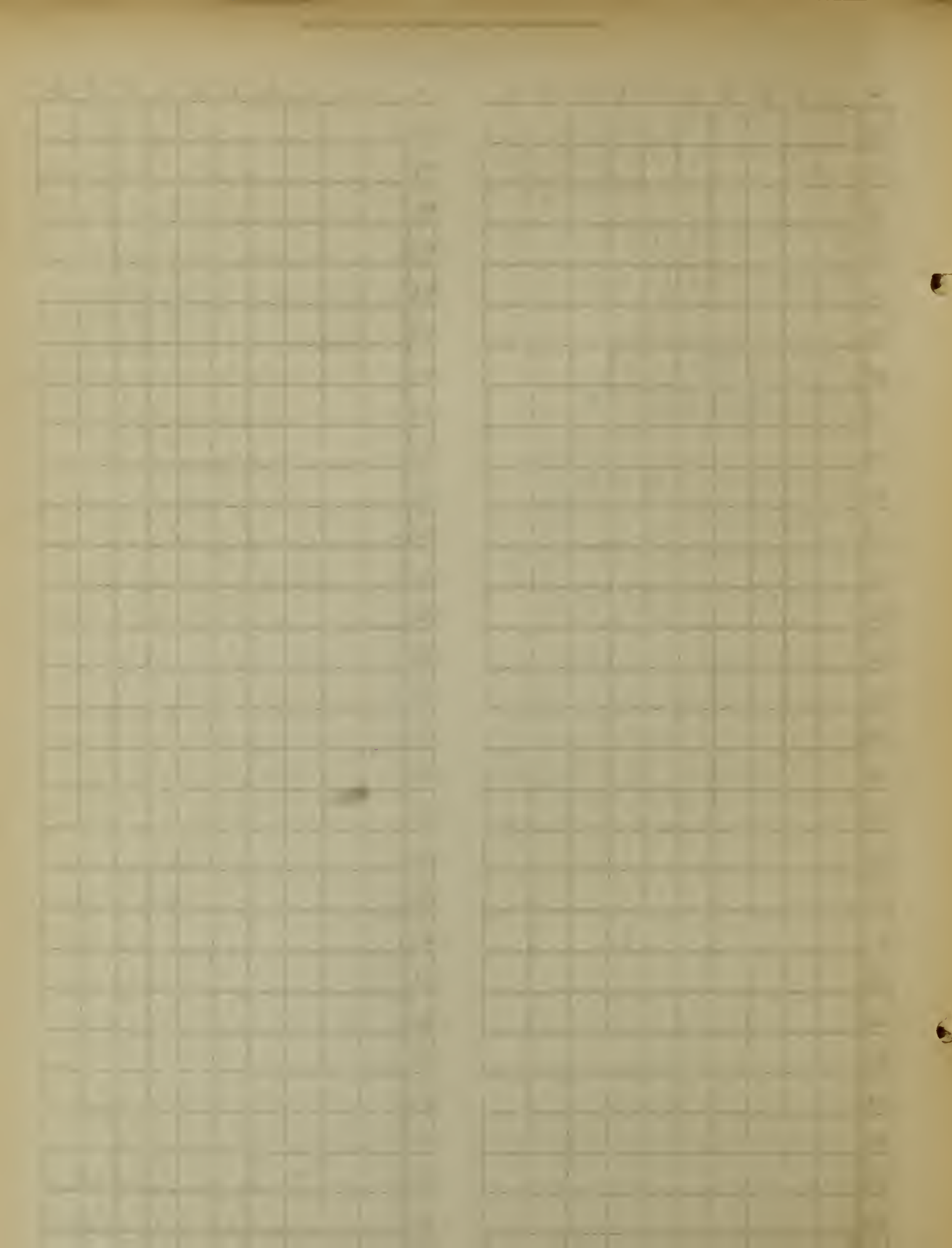
+	0	1	2	3	4	5	6	7	8	9
10	10	3	3	5	5	7	2	7	7	6
11	6	6	4	5	6	7	10	5	6	6
12	7	4	4	7	4	4	5	5	5	9
13	5	3	7	3	5	3	7	6	2	2
14	5	7	4	5	4	8	6	1	5	3
15	3	2	6	5	9	6	8	6	8	7
16	3	2	2	2	10	5	7	4	4	4
17	9	5	5	8	1	9	6	6	4	9
18	11	7	3	4	7	5	7	3	5	4
19	5	5	4	4	6	5	13	5	3	7
20	3	2	3	3	4	8	12	3	8	9
21	6	3	4	4	4	6	1	5	6	3
22	3	3	7	5	3	8	3	3	7	8
23	6	2	3	3	3	5	5	4	2	5
24	3	2	2	7	3	3	10	4	3	8

+	0	1	2	3	4	5	6	7	8	9
25	5	6	6		3	3	6	10	6	5
26	8	4	4	5	5	4	7	4	2	6
27	2	2		5	8	2	5	3	4	2
28	2	4	4	4	3	5	2	3	3	3
29	4	3	2	1	1	7	2	4	2	1
30	2	8	6	2	5	3	3	3	3	3
31	5	1	2	5	5	4	6	3	4	3
32	4	2	3	7	3	1	1	4	2	1
33	5	2	3	5	4	2		2	4	1
34	1	3	4	2	4	4	4	2		1
35	3	3	2	6	1	6	1	1	3	1
36	1		1		3	4	1	5	1	2
37		2		2		1	2	2	3	1
38		2	1		1		4	2		2
39			2	1			2		2	1

C

40				2	3	1	2	3
42		1			1			
45					3		1	1
48			1					
49		2	1	1				
54			1	1		1		
56		1			1			
63								
64					1			
72								
81								

[illegible]



SUMMARY

Strayer-Upton

TableVIII-A, section IX page 160

100 primary combinations are taught,

100 primary combinations are used.

Table VIII-B, section IX page 160

0 decade facts have been taught,

197 decade facts have been used.

Table VIII-C, section IX page 160

0 combinations beyond $39 + 9$ are taught,

54 combinations are used.

The combinations in this table should not be found in
an addition drill service.

Table IX, section IX page 161

The combinations found in this table have not been taught.

They are beyond social usage and should not be used. If the
author would revise several of his games the combinations
would be avoided.

TABLE VIII Section IX
Str yer-Upton

Color for Examples, Black

Color for Problems, Red

Group	<u>Summary</u>
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99	
100	

A

	0	1	2	3	4	5	6	7	8	9
0	19 3	2	1	3	3	2	4	6	3	6
1	64 22	76 15	91 8	81 1	66 2	68 5	58 3	59 3	42 5	68
2	10 1	37 9	33 4	33 4	30 2	29 7	45 3	30 4	22 4	35 3
3	13 3	27 5	34 5	43 2	43 9	35 5	50 6	33 4	35 3	24 2
4	7 1	30 6	32 9	21 1	32 4	28 9	38 9	30 4	28 1	20
5	11 3	17 8	26 8	20 3	28 5	33 6	27 6	25 6	18 1	38 1
6	8 1	29 2	40 2	27 1	32 1	32 3	22	41 3	37	42
7	14	28 1	41 7	37 4	30 3	41 2	29 2	30	38 5	38
8	9	38 1	37 1	33 1	34 1	37 3	29 5	42 5	26	40 1
9	16 1	24 2	27 3	29 1	30 2	40 6	31	38 4	40 2	39 2

B

	0	1	2	3	4	5	6	7	8	9
10	19	9	12	16	14	19	10	21	23	22
		2	4	3	4	4	3	4	3	2
11	15	13	16	14	21	23	31	25	17	17
		1	2	3	4	6	3	2	3	2
12	15	12	12	19	15	21	21	16	17	26
		1	3	2	5	4	2	3	3	1
13	7	15	20	13	21	19	17	19	13	13
		1	4	2	3	3	2	5	1	1
14	9	15	12	15	17	23	20	11	17	18
		1	3	2	4	6	2	1	1	2
15	5	11	12	21	24	25	14	21	19	19
		1	2	3	5	3	1	2	2	3
16	11	10	14	11	28	20	16	11	15	16
		1	3	4	5	2	1	1	1	1
17	18	16	14	21	14	21	27	21	14	20
		1	2	2	1	1	1	1	1	1
18	43	16	5	18	19	17	19	14	16	18
		1	1	2	1	1	1	1	1	2
19	12	8	16	13	18	14	22	11	13	18
		1	1	1	1	3	1	1	1	3
20	12	7	8	11	11	17	18	13	13	21
		1	1	1	1	3	2	1	1	1
21	10	9	9	13	11	12	11	10	9	13
		1	1	2	1	1	1	2	1	1
22	9	9	18	12	12	14	10	8	17	11
		1	1	1	1	1	1	1	1	1
23	7	8	7	10	11	12	16	17	7	15
		1	2	1	1	1	1	1	1	1
24	7	8	13	14	10	8	16	9	5	14
		2	1	1	1	1	3	1	1	1

+	0	1	2	3	4	5	6	7	8	9
25	7	12 1	14 1	5 1	9 1	8 2	11 1	14 1	11 1	7 1
26	11	6 1	8 1	8 1	12 1	7 1	14 1	10 2	7 1	9 1
27	5	9 1	3 1	11 1	10 1	5 1	13 1	10 2	12 1	5 1
28	4	6 1	6 1	8 1	9 2	6 2	3 1	7 1	5 1	7 1
29	8	7 1	3 1	3 1	3 1	8 1	4 1	6 1	6 1	4 1
30	5	10	8	4	7 1	6	6	5 1	10	4
31	6	6	3	7	5	4	8	3	5	7
32	5	7	7	11	6	2	5	6	6	3
33	6	5	5	9	6	5 1	4	5	9	5
34	1	3	4	2	7	6	5	4	2	2
35	6	3	3	6	1	8	4	4	3	3
36	2		2		4	5	2	6	5	3
37		3	2	4	1	5	3	4	4	3
38	2	3	2	4	3	2	5	3 1	2	3
39	1	3	2	4	1	1	3	1	4	2

0 1 2 3 4 5 6 7 8 9

C

40		1	1	4	3	1	3	3
42		4	1	1	2	1	2	
45		1	1	1	4	1	2	1 2
48		1	2	1	3	1	1	2 1
49		2	1	1				
54		1	2	2	1	2	1	1 1
56		2	1	1	2	1	1	1
63								
64		1	1	1	2	1	1	1
72								
81								

Account of the ...
...

...

Table with 10 columns and 15 rows. The columns are labeled with numbers 1 through 10. The rows contain various numerical entries, some of which are underlined.

Table with 10 columns and 15 rows. The columns are labeled with numbers 1 through 10. The rows contain various numerical entries, some of which are underlined.

Table with 10 columns and 15 rows. The columns are labeled with numbers 1 through 10. The rows contain various numerical entries, some of which are underlined.

Table with 10 columns and 15 rows. The columns are labeled with numbers 1 through 10. The rows contain various numerical entries, some of which are underlined.

TABLE IX Section IX
Strayer-Upton

[illegible]

THE SUMMARY

SUMMARY

It is obvious from the summary following the analysis of each drill service that it would be unfair and unwise to pick any one of these as perfect or ideal. Each of them has several commendable features which might merit its selection for class-room use. The reader who may be interested in making such a choice will find the worthy points of these three drill services assembled below in a comparative table designed to aid him in his consideration.

COMPARATIVE SUMMARY TABLE

WORTHY POINTS	IROQUOIS	100% ACCURACY	STRAYNER-UPTON
Primary facts taught	94	100	100
Primary facts used	100	100	100
Decade facts to 39 + 9 taught	8	300	0
Decade facts to 39 + 9 used	126	300	197
Multiplication facts above 39 + 9 taught	0	80	0
Multiplication facts above 39 + 9 used	60	80	45
Facts beyond social usage taught	0	0	0
Facts beyond social usage used	92	0	214
Number of teaching groups.	12	10	3

Another interesting comparison that might be added in summarizing these drill services is the method in which the authors endeavor to teach the various combinations. This comparison can be made by comparing the teaching tables in each drill service.

Using these teaching tables it will be found that the Iroquois drill service taught the combinations in twelve steps. The first teaching group contained nine combinations whose sums are ten and eight related decade combinations. The second teaching group contained nine primary doubles. The third group contained ten combinations whose sums are nine. The fourth group contained combinations whose sums are eight. The fifth group contained primary combinations whose sums are seven or seventeen. The sixth group contained primary combinations whose sums are six or sixteen, five or fifteen, four or fourteen, three or thirteen, two or twelve, and one or eleven. In the seventh group the primary combinations whose sums are six or sixteen are retaught. In group eight, the primary combinations whose sums are five or fifteen are retaught. In group nine the primary combinations whose sums are four or fourteen are retaught. The tenth group reteaches primary combinations whose sums are three or thirteen. The eleventh group reteaches primary combination whose sums are two or twelve. The twelfth group reteaches primary combinations whose sums are one or eleven.

The Wilson drill service presents the various combinations in ten steps. Each step contains some of the so-called hard combinations as well as some of the easy combinations. Each group contains ten primary combinations and the related decade combinations within social usage.

The Strayer-Upton drill service presents the primary combinations in three groups. The first group contains the first fifty combinations which the authors believe have been taught in grades one and two. The second group contains twenty five of the remaining combinations. The third group contains the remaining twenty five combinations.

As every writer has his own opinion as to how the various combinations should be presented, it is impossible to set any standard so that a fair comparison of the methods of presentation can be made.

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